Louvain School of Management

How does decentralized finance differ from the traditional banking system in terms of financial intermediation?

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Abstract

The research conducted in this dissertation aims to observe, analyze, and understand how decentralized finance differs from traditional finance in terms of financial intermediation. While banks have long played, and still play today, an essential role in our society and in economic development by collecting deposits, granting credit, producing information on borrowers, transforming liquidity, and managing risks, blockchain technology, of which decentralized finance is one of the main financial applications, proposes another form of organization. This organization relies in particular on tools such as smart contracts, liquidity pools, and automated mechanisms.

The objective of this work is to show how certain forms of financial intermediation are reconfigured by decentralized finance, without seeking to develop a binary analysis based on the presence or absence of financial intermediation in this model. This work begins by proposing a theoretical comparative analysis between the traditional banking model and decentralized finance, by observing the differences in functioning in the performance of major intermediation functions, such as fund allocation, information management, borrower selection, governance, trust, and risk management. The second part develops a comparative empirical analysis that seeks to observe, from a practical perspective, whether and how the concepts addressed in the literature review are reflected in real-world data. This analysis uses data from the Aave protocol, mainly for the USDT, USDC, and EURC stablecoins on Ethereum, as well as European banking data from the European Central Bank.

The observed results suggest that decentralized finance reproduces certain intermediation functions, such as connecting liquidity providers and borrowers, but by relying on a fundamentally different logic and processes. The data indicate more volatile rates that are more directly dependent on market conditions. The way deposited funds are transformed into credit also differs from that of the traditional banking system, and risk is mainly managed upstream through overcollateralization and automatic liquidation mechanisms. By contrast, banks retain an important advantage in information production, the financing of opaque agents, and large-scale liquidity transformation.

Based on the information collected throughout this work, this dissertation concludes that decentralized finance does not eliminate financial intermediation, but rather changes its form. Intermediation shifts from an institutional, relational, and regulated model to a more automated, standardized, protocol-based model that depends on various mechanisms, notably collateral.

Acronyms:

AMM = Automated Market Maker

DAO = Decentralized Autonomous Organization

DApp / Dapps = Decentralized Application(s)

DeFi = Decentralized Finance

DEX = Decentralized Exchange

EURC = Euro Coin / euro-backed stablecoin ticker

LP = Liquidity Provider

LTV = Loan-to-Value

NPL = Non-Performing Loan

SME = Small and Medium-sized Enterprise

TradFi = Traditional Finance

USDC = USD Coin

USDT = Tether / USD Tether

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1. Introduction

Throughout its history, the financial sector has always been in a state of constant evolution, even permanent revolution. Over the past several decades, technology has significantly altered the way financial services are produced, distributed and accessed. This transformation has recently accelerated with the digitization of financial services and the emergence of blockchain-based infrastructures. One of the most important applications of blockchain to finance is decentralized finance, or DeFi. « *DeFi is a blockchain-based financial infrastructure that has recently gained a lot of traction. The term generally refers to an open, permissionless, and highly interoperable protocol stack built on public smart contract platforms, such as the Ethereum blockchain* » (Schär, 2021). It is described as decentralized because some financial functions are organized through protocols, smart contracts, liquidity pools and automated mechanisms rather than through a single centralized institution (*Schär, 2021*). This development challenges the traditional understanding of financial intermediation. In the traditional banking system, banks act as trusted intermediaries between savers and borrowers. They collect deposits, grant loans, produce information on borrowers, manage risks and contribute to the stability of financial exchanges. On the other hand, DeFi reduces the role of traditional intermediaries by transferring certain functions to code-based protocols and automated infrastructures. More broadly, blockchain innovations challenge how financial services are produced, distributed and priced, by questioning some of the positions traditionally held by established intermediaries (*Schär, 2021; Zetzsche et al., 2020; Philippon, 2016*).

From a practical perspective, traditional banks, which have often been considered pillars of financial stability, are increasingly compared with blockchain-based systems that promise greater transparency, accessibility and automated execution of financial services (*Schär, 2021*). DeFi applications provide services such as lending, borrowing, trading and liquidity provision through blockchain-based protocols, thereby shifting part of the execution and coordination of financial transactions away from traditional intermediaries (*Schär, 2021; Gudgeon et al., 2020*). However, this does not mean that DeFi eliminates financial intermediation altogether.

This study therefore addresses the following research question: *How does decentralized finance (DeFi) differ from the traditional banking system in terms of financial intermediation ?*

To answer this question, this dissertation will first present a theoretical analysis of the traditional banking model, focusing primarily on its intermediation mechanisms, institutional framework and risk governance. The same analysis will then be conducted for the decentralized model by examining its approach to financial intermediation through mechanisms such as smart contracts, liquidity pools and decentralized exchanges, as well as the promises of transparency, decentralization and accessibility associated with this emerging system (*Schär, 2021*). On this basis, the two models will be compared according to the essential functions of financial intermediation: the allocation of funds and the provision of liquidity, the production of information and the selection of borrowers, risk management and stability, as well as governance, trust and the nature of the intermediary (*Freixas & Rochet, 2008; Allen & Santomero, 1998*). This comparison will seek to determine whether decentralized finance substitutes for, complements, or reconfigures traditional financial intermediation.

The second part of this study aims to determine the extent to which the theoretical concepts developed in the literature review are reflected in real-world data. The empirical analysis uses data from both DeFi and traditional banking as proxies for several intermediation functions. On the decentralized finance side, the scope of the data is limited to stablecoins USDT and USDC, and to EURC for the interest rate analysis, on the Ethereum blockchain and the Aave protocol. On the traditional banking side, the data are limited to the euro area. The reasons for these choices are detailed in Chapter 3.1. The analysis will be supported by illustrative graphs and will focus on observable indicators related to the pricing of intermediation, liquidity allocation and risk management.

However, this study faces several limitations. First, structural differences in terms of organization and technological infrastructure between DeFi and traditional finance make it difficult to construct perfectly comparable datasets. As a result, the datasets used in this study should not be interpreted as strictly equivalent measures, but rather as proxies that help observe how each model performs specific functions of financial intermediation. In addition, access to DeFi data often requires the use of private crypto analytics platforms, some of which restrict access to historical data or advanced features through subscription or payment systems. Consequently, some datasets offer higher-frequency observations but over shorter time horizons.

This study therefore does not aim to demonstrate that DeFi eliminates financial intermediation, but rather to analyze how it reconfigures its organization. It also aims to highlight the limitations of this reconfiguration, particularly regarding information production, access to credit and risk absorption. By comparing these two systems, the dissertation moves beyond the binary opposition between intermediation and disintermediation, and understands contemporary financial intermediation as a process of functional reconfiguration.

2. Literature review

2.1. The Traditional Banking Model

The purpose of this chapter is to present the traditional banking model by highlighting the economic and institutional functions through which financial intermediation is carried out.

2.1.1. Definition and Core Functions of the Current Banking Model

The current banking model refers to an institutional framework within which banks operate as central actors in modern financial systems. In addition to their role in credit allocation, banks are versatile institutions carrying out different activities such as liquidity provision, balance sheet transformation, payment services as well as risk management. In the economic literature, banks are generally defined as institutions that issue liquid liabilities, mainly deposits, while holding illiquid and risky assets, a characteristic that fundamentally differentiates them from other financial entities (*Freixas & Rochet, 2008*).

A major element of the modern banking model lies in the structure of banks' balance sheets. They rely mainly on deposits, which are repayable in the short term and are used both as a store of value and as a means of payment. On the asset side, banks hold long-term claims and less liquid assets such as loans to households and firms. This architecture allows banks to carry out maturity, liquidity and risk transformation, thereby facilitating the financing of economic activity, which would otherwise be restricted by the preferences and constraints of individual agents (*Gorton & Winton, 2003*).

Providing liquidity is one of the main functions of banks. By giving depositors the possibility of immediately accessing their funds, banks protect economic agents against idiosyncratic liquidity needs. *Diamond & Dybvig (1983)* as well as *Freixas & Rochet (2008)* argue that this provision of liquidity improves welfare by allowing agents to smooth their consumption in situations of uncertainty. Although this function exposes the banking system to the risk of a bank run, it nevertheless remains inherent to TradFi and supports the widespread use of deposits as money-like instruments.

The transformation of financial risks is closely associated with the function of liquidity provision. Banks absorb and manage risks that individual savers are neither able nor willing to bear, notably credit risk, maturity risk and interest rate risk. Through diversification and portfolio management, they distribute risks across different borrowers and over time, thereby contributing to the stabilization of returns offered to depositors. This risk transformation function constitutes a fundamental characteristic of banking activity and contributes to the resilience of the financial system as a whole, provided that it takes place within an effective regulatory framework (*Freixas & Rochet, 2008*).

Beyond balance sheet transformation, banks are central to the functioning of payment systems. By providing transaction accounts and facilitating the clearing and settlement of payments, banks reduce transaction costs and allow economic exchanges to take place properly. From a more macroeconomic perspective, this function places banks at the heart of the monetary system and reinforces their systemic importance (*Hancock & Humphrey, 1997*). Payment services therefore constitute a key operational dimension of the banking model, distinct from credit-granting activity.

Another decisive function of banks lies in the production and management of information. Financial markets are indeed characterized by uncertainty and information asymmetry, particularly regarding borrowers' creditworthiness. Banks thus develop specific expertise in the assessment, monitoring and management of financial risks, thanks to specialized organizational structures and long-term relationships with their clients. This informational advantage promotes prudent decisions and contributes to the overall efficiency of financial systems (*Bhattacharya & Thakor, 1993*).

These different functions: liquidity, maturity transformation, payments and information production, should not be viewed in isolation. They form a coherent system in which each activity strengthens and conditions the others. Although their scope has evolved under the effect of financial innovations and regulatory transformations, their fundamental logic remains unchanged in modern economies (*Allen & Santomero, 2001*). It is precisely this logic that the following subsection will seek to deepen, by examining the concrete mechanisms through which banking intermediation is organized and operates.

2.1.2. Current Banking Intermediation

Banking intermediation refers to all the mechanisms through which banks transfer funds, reduce informational frictions and finance the real economy by modifying financial contracts and distributing risks among agents. It constitutes the core of the traditional banking model. Thus, banks differ from direct financing in that they select borrowers, monitor commitments, structure contracts and maintain an ongoing relationship with them (*Freixas & Rochet, 2008*). However, contemporary banking intermediation no longer corresponds solely to a traditional model of holding loans. It now operates within a more hybrid form, in which banks continue to create and often hold credit, while relying more on market instruments, securitization and fee-generating services (*Allen & Santomero, 2001*).

The very existence of this intermediation is explained by information asymmetries and monitoring costs. When investors cannot properly observe the behavior or risk profile of borrowers, direct lending becomes inefficient because of adverse selection, understood as the difficulty of distinguishing low-risk from high-risk borrowers before the loan is granted, and moral hazard, which refers to borrowers' possible unobservable actions after receiving funds. Banks reduce these frictions through borrower screening and ex post monitoring, which improves credit allocation and reduces agency costs (Bhattacharya & Thakor, 1993; Freixas & Rochet, 2008). *Diamond (1984)* formalizes this idea through the notion of delegated monitoring: the bank acts as a specialized monitor, capable of exploiting economies of scale in the production of information and of imposing more effective discipline than different creditors. This informational role remains central in current intermediation, particularly for opaque borrowers, such as SMEs, whose access to market financing remains limited or costly (*Boot, 2000*). The banking relationship further strengthens this function, as banks accumulate over time what is called "soft information", meaning qualitative, contextual and difficult-to-transfer information, which is useful for credit decisions, contract renegotiation and support during periods of difficulty. In segments where information is poorly standardized, this long-term relationship reduces information asymmetries and allows for an intertemporal sharing of risks between the bank and the borrower (*Boot, 2000; Freixas & Rochet, 2008*).

These theoretical foundations should not, however, obscure the profound transformations that banking intermediation has undergone. It is often associated with an "originate-to-hold" model, in which loans remain on the balance sheet and are mainly financed by deposits. Yet, since the end of the twentieth century, many banking systems have evolved towards practices known as "originate-to-distribute", where banks grant credit and then transfer part of the exposure to other investors through securitization or the sale of loans to third parties (*Purnanandam, 2011*). However, intermediation does not disappear. It partly shifts towards functions of structuring, pricing and risk management, while the final exposure is increasingly shared with external investors. This evolution towards originate-to-distribute is part of a broader movement of marketization of financial intermediation. Indeed, large international institutions are no longer financed solely through retail deposits, but also through interbank markets, repo markets and various short-term debt instruments. *Adrian and Shin (2010)* show that this dependence on market funding increases the "procyclicality" of bank balance sheets. When perceived risks decrease, banks increase their leverage and the size of their balance sheet. Conversely, when risks increase, rapid deleveraging can contract the supply of credit and tighten financial conditions. This sensitivity to liquidity conditions in wholesale markets represents one of the structural vulnerabilities of the contemporary banking model.

The rise of securitization and "shadow banking" further accentuates this transformation. A significant share of credit creation now takes place outside traditional bank balance sheets, through broker-dealers, money market funds or structured investment vehicles, which also carry out maturity and liquidity transformation without falling under the same regulatory perimeter as banks. *Gorton and Metrick (2012)* emphasize the intrinsic fragility of these structures, linked to their dependence on short-term secured funding and their vulnerability to panics in repo markets. However, this does not mean that the role of banks disappears. *Pozsar et al. (2013)* describe shadow banking as a parallel intermediation chain in which credit creation is fragmented among specialized institutions, while banks retain a central position through liquidity support, credit lines and securitization activities. The observed disintermediation therefore refers more to a reconfiguration of intermediation functions than to their removal.

At the same time, banks' sources of income have become deeply diversified. They no longer derive most of their profits from interest margins, but have expanded their activities towards fee-based services, underwriting, advisory services, asset management, hedging through derivatives and payment services. *Allen and Santomero (2001)* interpret this evolution as an adaptation to competitive pressures and financial innovation. Banks thus move from simple asset transformation to a broader intermediation of risks, facilitating their trading and distribution across the financial system. This evolution does not, however, replace traditional intermediation, as many borrowers remain dependent on bank credit and relationship-based financing, while market-oriented activities broaden the financing and hedging opportunities available to firms (*Freixas & Rochet, 2008*).

Contemporary banking intermediation therefore cannot be reduced to a single model. Its founding principle, reducing informational frictions through screening, monitoring and relationship-based financing, remains relevant, particularly for borrowers whose access to markets remains limited (*Diamond, 1984; Boot, 2000*). But this logic now coexists with growing integration into capital markets, increased dependence on wholesale funding and the development of off-balance-sheet activities. This hybridization is not without tension: it allows banks to expand the supply of credit and diversify their revenues, but at the same time makes them more vulnerable to systemic liquidity shocks (*Gorton & Metrick, 2012*). It is within this complex institutional context that the question of banking risk governance and regulation arises, which the following subsection proposes to examine.

2.1.3. Institutional Constraints and Risk Governance in the Traditional Banking Model

Banking intermediation cannot be dissociated from the institutional framework within which it takes place. It integrates a set of institutional mechanisms designed to preserve the stability and resilience of financial institutions. Banks are indeed exposed to several types of risks, notably credit, liquidity and market risks, which stem directly from their intermediation activity and from the structure of their balance sheet. Equity capital therefore plays an essential role as a loss-absorbing buffer, by limiting the probability of institutional failure and contributing to the protection of the financial system as a whole (*Freixas & Rochet, 2008*).

In most economies, capital holdings are therefore subject to a regulatory framework aimed at reducing banks' incentives to adopt excessively risky behavior. This issue is all the more important as certain mechanisms, such as deposit insurance, can generate moral hazard by weakening the discipline exercised by creditors and by transferring part of the potential losses to the State or to guarantee schemes. This is why capital requirements are used as a central instrument of banking regulation, making it possible to moderate these incentives while influencing the structure of banks' balance sheets as well as their capacity to generate liquidity and finance the economy (*Van den Heuvel, 2008*). More broadly, capital regulation reflects a trade-off between two fundamental objectives: guaranteeing the stability of the banking system and limiting the cost of financial crises, while preserving a sufficient level of intermediation to support economic activity (*Kashyap, Rajan & Stein, 2008*).

Moreover, banking activity is subject to a broader prudential framework, made necessary by the very structure of banking intermediation. By financing relatively illiquid assets with liquid liabilities, mainly demand deposits, banks perform an essential function of liquidity creation, but also expose themselves to liquidity risks. *Diamond and Dybvig (1983)* show that this structure can indeed make banks vulnerable to bank runs, in which depositors simultaneously withdraw their funds out of fear of failure, potentially leading to the premature liquidation of illiquid assets. This fragility partly constitutes the counterpart of the liquidity creation function. *Diamond and Rajan (2001)*, for their part, suggest that this vulnerability may even strengthen the credibility of banks' commitment to liquidity provision. In this sense, public intervention aims to contain the systemic risks linked to this activity, through instruments such as banking supervision, capital requirements and deposit insurance. These mechanisms aim to maintain financial stability, limit excessive risk-taking linked to moral hazard and strengthen the resilience of the banking system as a whole (*Hellmann, Murdock & Stiglitz, 2000; Freixas & Rochet, 2008*).

Banking stability does not depend solely on external regulation, it is also conditioned by the internal governance structure of institutions. In the logic of agency theory, the separation between owners and managers generates conflicts of interest that may bias investment decisions and encourage excessive risk-taking (*Jensen & Meckling, 1976*). These tensions are particularly acute in the banking sector because the complexity of activities and the opacity of balance sheets make it difficult to accurately assess the risks actually taken by managers, weakening the ability of shareholders and regulators to exercise effective monitoring (*Freixas & Rochet, 2008*).

In response to these governance risks, certain market discipline mechanisms can nevertheless play a corrective role. The particular structure of bank deposits provides a concrete example: the possibility for depositors to withdraw their funds in the event of a loss of confidence creates disciplinary pressure on managers (*Calomiris & Kahn, 1991*). "Franchise value", meaning the future economic value of banking activity, plays a similar role: a bank that anticipates significant future profits would have a greater interest in adopting prudent behavior in order to preserve its reputation (*Hellmann, Murdock & Stiglitz, 2000*). These mechanisms are not always sufficient, as recurrent banking crises show, but they remind us that the stability of the banking system is the product of complex interactions between regulation, internal governance and market discipline.

2.2. The Emergence of Blockchain and Decentralized Finance (DeFi)

2.2.1. Origins and Technological Foundations of Blockchain

For several decades, financial transactions have relied mainly on centralized infrastructures, such as banks, clearing houses and payment systems, responsible for ensuring record-keeping, compliance with rules and the finality of settlements. Although this architecture has enabled the development of reliable exchanges on a large scale, it also involves coordination costs, dependence on central institutions and certain operational vulnerabilities. It is in this context, marked by a broader questioning of financial infrastructures after the 2008 crisis, that blockchain emerged, a technology proposing a radically different organization of the recording, validation and transmission of transactions (*Catalini & Gans, 2016*).

Blockchain can be understood as a distributed ledger designed to record transactions and property rights in a shared database, maintained by a decentralized network of participants. Each member of the network keeps and verifies an identical copy of the transaction history, which ensures the consistency of the ledger without relying on a single central authority. From an economic perspective, it is therefore a market infrastructure in which record-keeping and verification are no longer carried out by a single central actor, but by the entire network (*Schär, 2021*).

The absence of a central authority, however, raises a fundamental question: how can the uniqueness and integrity of transactions be guaranteed in a decentralized digital environment ? This difficulty refers to the problem of double spending, that is, the risk that the same digital asset may be used or transferred several times in the absence of a trusted third party (*Catalini & Gans, 2016*). Blockchain systems respond to this problem through consensus mechanisms, which allow participants to adopt a common and authoritative version of the ledger. These mechanisms rely on protocol rules as well as on economic incentives designed to encourage honest behavior by validators and to ensure the validity of the transactions recorded in the ledger (*Aramonte, Huang and Schrimpf, 2021; Auer et al., 2024*).

The decentralization of blockchain networks does not, however, imply a complete absence of governance. The functioning of these systems requires mechanisms for validation, maintenance and protocol updates, which structure the organization of the network. Several studies emphasize that the decentralization observed in blockchain systems is often relative, insofar as certain functions may remain concentrated in the hands of a limited number of actors, particularly developers and validators. In this respect, *Aramonte, Huang and Schrimp, (2021)* refer to a possible “illusion of decentralization”, linked to the partial concentration of technical and decision-making power in certain networks.

The security of blockchain networks also relies on cryptographic techniques designed to guarantee the integrity of transactions and the authentication of property rights. These mechanisms make it possible to secure exchanges by making the ex post modification of data recorded in the ledger very difficult. In this context, participants’ trust partly relies on the robustness of the protocol, the cryptographic architecture of the network and the automatic execution of the rules embedded in the code (*Schär, 2021*).

The introduction of Ethereum and, more broadly, the rise of programmable blockchains have played a central role in the development of decentralized finance. Unlike the first blockchains, which were mainly designed for the recording and transfer of assets, these infrastructures allow the use of smart contracts, that is, self-executing programs that automatically apply predefined rules without manual intervention (*Schär, 2021*; *Auer et al., 2024*). These mechanisms make it possible to automate more complex operations, such as transactions, loans or collateral management. Blockchain therefore ceases to be merely a distributed ledger and also becomes an infrastructure capable of hosting more elaborate financial services (*AMF, 2023; BIS, 2023*). This development constitutes the technological foundation of decentralized finance discussed in the following section.

From a systemic perspective, blockchain architectures are generally presented as multi-layered systems integrating settlement functions, digital assets and application protocols (Schär, 2021). This modular structure promotes innovation and composability, insofar as different protocols can be developed, combined and articulated on the same technical infrastructure. It thus enables the provision of financial services directly on the blockchain, without the need to create an independent infrastructure each time (*Schär, 2021; Auer et al., 2024*).

Blockchain therefore represents much more than a simple recording tool. Based on a shared ledger, consensus mechanisms and cryptographic techniques, it proposes an architecture in which trust is produced by the protocol rather than by an institution. The rise of programmable blockchains and smart contracts has further broadened this logic, paving the way for financial applications whose complexity goes far beyond the simple transfer of assets. It is precisely within this space that decentralized finance has developed.

2.2.2. Mechanisms of DeFi

The term decentralized finance (DeFi) « *refers to an alternative financial infrastructure built on top of the Ethereum blockchain. DeFi uses smart contracts to create protocols that replicate existing financial services in a more open, interoperable, and transparent way* » (*Schär, 2021, p. 153*). As stated in this definition, these services mainly use public infrastructures such as Ethereum, which has historically been dominant in the DeFi ecosystem, even though other programmable networks such as Polygon, Avalanche or Solana are also occupying an increasingly important place (*Schär, 2021; Auer et al., 2024 ; CoinMarketCap, n.d.*). In this environment, financial operations are not executed by a centralized institution, but by self-executing programs recorded on the blockchain, whose rules are coded in advance and applied automatically (*Schär, 2021; BIS, 2023*). DeFi protocols are also generally open source[1], which allows their mechanisms to be observed, reused and combined in other applications (*AMF, 2023; Auer et al., 2024*). Users interact with these protocols through DApps, which serve as an interface between economic agents and smart contracts while maintaining an on-chain execution logic (*BIS, 2023*). This modular and composable architecture, made up of a plurality of specialized protocols that can be articulated with one another, enables the provision of exchange, lending, borrowing, liquidity management and governance services (*Schär, 2021; Auer et al., 2024*).

Lending and borrowing constitute one of the most essential functions of the DeFi ecosystem. They allow users to lend or borrow digital assets through automated protocols based on smart contracts (*Schär, 2021; Auer et al., 2024*). These protocols define the conditions for access to credit, organize asset flows and automatically apply rules relating to collateral, interest and

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[1] « *Open-source software (OSS) is software whose source code is developed and maintained through open collaboration. Anyone can use, examine, modify, and redistribute this software as they see fit, generally at no cost.* » (IBM, n.d.)

liquidations, without any centralized authority intervening in a discretionary manner (*Schär, 2021; BIS, 2023*). In practice, a user wishing to lend their assets deposits them into a specialized contract, while a borrower can access these assets provided that they supply sufficient collateral, generally in the form of another crypto-asset (*Auer et al., 2024; ECB, 2022*). Due to the absence of an individualized assessment of creditworthiness, DeFi loans most often rely on a logic of overcollateralization, with the value of the deposited collateral having to exceed the value of the borrowed asset (*ECB, 2022; Auer et al., 2024*). This requirement aims to limit default risk in an environment where rules are standardized and where the protocol does not produce credit information in the traditional sense (*ECB, 2022; Schär, 2021*).

Loan contracts are generally not structured around a fixed maturity comparable to that of a traditional bank loan. The borrower retains the initiative to repay as long as their position complies with the collateral constraints defined by the protocol (*Chiu et al., 2024*). During this period, the borrower pays interest, the level of which is determined algorithmically according to the supply and demand for liquidity on the protocol (*Schär, 2021; Auer et al., 2024*). More precisely, rates increase when the utilization of an asset is high relative to the amount available in the liquidity pool[2], and decrease in the opposite case (*Schär, 2021; Auer et al., 2024*). This mechanism aims to automatically adjust the incentives of lenders and borrowers in order to maintain the balance of the system and the continuity of the lending service. It therefore constitutes an essential feature of lending in DeFi, where credit pricing is directly integrated into the rules of the protocol (*Schär, 2021; Auer et al., 2024*).

Collateral management is the mechanism that conditions the entire system. To measure the sustainability of a position, protocols generally use the loan-to-value ratio (LTV), this ratio "*defines the maximum amount that can be borrowed with a specific collateral*" (*Chiu et al., 2024, p. 35*). It is obtained by dividing the borrowed amount by the value of the collateral provided. A maximum LTV level is set in advance by the protocol, it determines either the borrowing capacity based on a given collateral, or the amount of collateral required to borrow a given value of another asset. When the value of the collateral falls sharply and the ratio reaches a critical threshold, the protocol may trigger a partial or total liquidation of the position (*Chiu, Ozdenoren, Yuan & Zhang, 2024; Schär, 2021*). The collateral is then sold in order to repay the lender, while a liquidation premium is paid to the actor who executes this operation

[2] See Section 2.2.2.1

(*Schär,2021*). To perform these calculations, protocols need real-time price information. For this purpose, they use oracles, that is, mechanisms that allow external data relating to the market value of assets to be introduced into smart contracts (*Chiu, Ozdenoren, Yuan & Zhang, 2024*). The reliability of these oracles is therefore as decisive as the quality of the collateral itself for the stability of the system (*Chiu, Ozdenoren, Yuan & Zhang, 2024*).

2.2.2.1. Liquidity Pools

Liquidity pools are one of the fundamental mechanisms of DeFi. They are reserves of digital assets locked in smart contracts and made available for different financial services, notably lending, exchanges, certain derivatives products or even insurance mechanisms (*Auer et al., 2024*). From a functional point of view, a pool can be understood as a collective reservoir of liquidity in which users deposit assets in order to make them available to other participants in the protocol (*Schär, 2021*). Depending on the use concerned, the structure of the pool may differ. In the case of lending, pools are often single-asset pools, while other applications, such as decentralized exchanges, often rely on multi-asset pools (*Auer et al., 2024; Schär, 2021*).

When a user provides funds to a pool, they become a liquidity provider. In return for their deposit, the protocol generally grants them a liquidity provider token (LP token), which represents their share in the pool and serves as the basis for calculating the revenues to which they may be entitled (*Auer et al., 2024; Schär, 2021*). These revenues come from the use of the assets made available, in the form of interest in lending protocols or transaction fees in exchange protocols (*Schär, 2021*). Some protocols add an additional incentive mechanism to this, known as liquidity mining, which grants liquidity providers additional tokens, often in the form of the protocol's native token (*Auer et al., 2024*). This mechanism has played an important role in the rapid growth of the DeFi ecosystem, by encouraging the deposit of assets and the expansion of available liquidity across the different protocols (*Auer et al., 2024; BIS, 2023*).

2.2.2.2. Decentralized Exchange (DEX) and Automated Market Makers (AMM)

Decentralized exchanges, or DEXs, allow digital assets to be exchanged directly on the blockchain, without going through a centralized intermediary or a traditional order book (*Schär, 2021; BIS, 2023*). In many cases, these exchanges rely on mechanisms known as automated market makers (AMMs) (*Schär, 2021*). Instead of directly matching buyers and sellers, AMMs use liquidity pools and algorithmic rules to ensure the pricing and execution of transactions (*Schär, 2021; Auer et al., 2024*). Prices therefore do not, for the most part, result from a traditional order book, but from predefined formulas applied to the reserves of assets available in the pool. Market making, originally carried out by specialized institutions, is here replaced by a fully coded and automatic procedure (*Schär, 2021; BIS, 2023*).

In practice, liquidity providers generally deposit two assets of equivalent value into a multi-asset pool (*Schär, 2021*). In return, they receive an LP token attesting to their participation (*Schär, 2021; Auer et al., 2024*). Users wishing to exchange one asset for another then interact directly with the pool (*Schär, 2021; BIS, 2023*). The operation leads to a change in reserves, which automatically affects the relative price of the assets according to the formula adopted by the protocol (*Schär, 2021*). For each exchange, transaction fees are charged and largely redistributed to liquidity providers in proportion to their contribution to the pool, although some protocols may retain a fraction of these fees according to their governance rules (S*chär, 2021; Auer et al., 2024*). Thus, DEXs and AMMs are based on the interaction between liquidity deposited by users, algorithmic rules for price formation and the automatic redistribution of revenues generated by market activity (*Schär, 2021; Auer et al., 2024*).

Ultimately, lending and borrowing, liquidity provision and decentralized exchanges are organized according to a programmable and continuous logic, in which financial functions are executed directly by the software infrastructure (*BIS, 2023; Auer et al., 2024*). This architecture relies on a combination of smart contracts, liquidity pools, automated pricing rules and overcollateralized guarantees (*Schär, 2021; BIS, 2023*). It forms a modular environment in which specialized protocols can be combined in order to produce increasingly diversified financial services within the blockchain ecosystem (*Schär, 2021; Auer et al., 2024; BIS, 2023*).

2.2.3. The Promises of DeFi: Transparency, Decentralization, and Accessibility

DeFi is not limited to a technical innovation; it is also driven by a set of promises that have largely fueled the interest generated by this ecosystem. The literature generally distinguishes three of them: increased transparency of rules and transactions, decentralization of the provision and organization of financial services, and continuous and, in principle, open accessibility to digital markets (*Schär, 2021*). These three dimensions structure the following subsections.

2.2.3.1. Transparency

Transparency is undoubtedly the most directly visible promise in the technical architecture of DeFi. In DeFi protocols, the rules for executing operations are coded in advance and the code of the contracts can, in principle, be publicly consulted and analyzed. Similarly, transactions are recorded on a distributed ledger accessible to everyone, which makes it possible to observe asset flows, the state of certain liquidity pools or the collateral deposited in protocols (*Schär, 2021*). This configuration supports the idea of a form of finance in which the rules of access, pricing and execution would be more visible than in systems based on private databases and on intermediaries that only make part of the information public.

From an economic perspective, this increased visibility is sometimes presented as a way of reducing certain information asymmetries. By making data relating to the functioning of the protocol, the allocation of resources and the transaction history accessible, blockchain can reduce the costs of verifying certain information and limit dependence on a third party responsible for centralizing or certifying these data (*Catalini & Gans, 2016*). The transparency promised by DeFi is therefore not limited to the mere publication of information, it refers more broadly to a transformation of the ways in which trust and verification can be produced in the digital financial environment.

This promise of transparency nevertheless faces concrete limits. The fact that the code is public does not necessarily mean that it is understandable for an ordinary user, and the same applies to the underlying economic mechanisms. The multiplicity of protocols, the complexity of certain on-chain interactions and the dependence on external elements, notably oracles, can make the interpretation of information more difficult. In this sense, DeFi can offer strong data visibility while retaining a form of functional opacity for non-specialized users (*BIS, 2021; Auer et al., 2024; BIS, 2023*).

2.2.3.2. Decentralization

The second fundamental promise of DeFi is decentralization. In its theoretical conception, the provision of financial services does not depend on a single entity responsible for holding assets, validating transactions or discretionarily setting the conditions of market access. Protocols are open, execution rules are encoded in smart contracts and, in many cases, users themselves retain custody of their assets. This organization supports the idea of a form of finance that is less dependent on centralized institutions and more directly coordinated by the technical infrastructure and by the rules of the protocol (*Schär, 2021; Zetzsche et al., 2020*).

This promise also relies on the existence of specific governance mechanisms. Many DeFi protocols issue governance tokens that give their holders the possibility to participate in decisions relating to the evolution of the protocol, the adjustment of certain risk parameters or the implementation of updates. From this perspective, governance can be presented as an alternative to more traditional hierarchical structures, in which control would be distributed among the participants of the protocol rather than concentrated within a single organization (*Zetzsche et al., 2020; BIS, 2023*).

However, literature moderates this optimism. Several articles show that, in practice, DeFi often presents significant forms of concentration, whether in protocol development, the holding of governance tokens, validation, liquidity provision, the use of oracles or access to user interfaces. *Aramonte, Huang and Schrimpf (2021)* thus refer to a "decentralization illusion", while the *BIS (2023)* mentions possible false decentralization claims, insofar as certain decisive functions remain in the hands of a limited number of actors (*Aramonte, Huang and Schrimpf, 2021; BIS, 2023 ; Schär, 2021*). DeFi therefore reconfigures the sources of financial power more than it removes them.

2.2.3.3. Accessibility

The third major promise of DeFi lies in its accessibility. In principle, protocols deployed on public blockchains can be used without interruption, independently of opening hours, national borders or traditional institutional barriers. DeFi applications thus operate continuously, twenty-four hours a day and seven days a week, and theoretically require only Internet access and the use of a compatible wallet to interact with the protocols (*Schär, 2021*). This openness supports the idea of a potentially global financial infrastructure, accessible to any connected user.

From an economic perspective, this permanent accessibility modifies the ways in which certain financial services can be accessed. The execution of transactions, the provision of liquidity or the use of lending or exchange protocols no longer depend on an institutional calendar or continuous human intervention, but on coded rules and automated infrastructure. In this logic, liquidity can be made available continuously, and users can interact with the system without going through prior institutional filtering. The *BIS (2023)* thus emphasizes that stablecoins[3], DApps and lending or exchange protocols contribute to structuring an environment in which access to services is, in principle, more direct and more permanent.

[3] « *Stablecoins are designed to keep their value stable against a fiat currency, and as their issuers connect–via their balance sheet–crypto and traditional money markets* » (*Barthélemy, Gardin & Nguyen, 2025, p .1*)

The effective accessibility of DeFi nevertheless remains conditioned by constraints that the technical openness of the protocol alone is not sufficient to erase. Access to it requires a certain level of digital understanding, mastery of specific technical tools, as well as the ability to bear the costs linked to transactions, particularly when networks are congested. *Schär (2021)* also emphasizes that scalability problems, high transaction fees and complexity of use can limit effective access to protocols, particularly for users with small amounts or limited technical skills. DeFi thus appears less as a universally inclusive system than as a potentially more open infrastructure, whose real accessibility depends on specific technical, economic and knowledge-related conditions.

These three promises, transparency, decentralization and accessibility therefore make it possible to understand why DeFi is often presented as a major institutional break. They shape a model in which trust would rely on the protocol rather than on the institution, and in which access to financial services would be governed by coded rules rather than by discretionary intermediaries. However, the literature also shows that their effective scope is uneven and depends on the concrete operating conditions of the protocols (*Schär, 2021; Aramonte, Huang and Schrimpf, 2021; BIS, 2023*). It is precisely this gap between theoretical promises and practical reality that makes the analytical comparison with the traditional banking model interesting.

2.3. Comparative Analysis of Financial Intermediation in Traditional Banking and Decentralized Finance

2.3.1. Comparison Framework

The two previous chapters highlighted two models of financial organization with very different architectures. However, they pursue, at least in part, similar economic functions, such as the allocation of funds, the provision of liquidity, risk management and the reduction of certain informational frictions. Thus, the following comparison will not focus on the technologies used by each system, but on the way in which each performs the central functions of financial intermediation.

This comparison does not follow a binary logic between the presence and absence of intermediation, but rather an analysis of two different modalities of intermediation. As developed in Chapter 2.1, in the TradFi model, intermediation relies on specialized institutions that collect deposits, select borrowers, monitor credit, transform the maturity and liquidity of balance sheets and operate within a regulatory framework. In decentralized finance, these functions are taken over by protocols, smart contracts and automated mechanisms based on blockchain. The banking system therefore relies on institutional, relational and discretionary intermediation, whereas DeFi tends to organize financial exchanges through more protocol-based, automated and standardized intermediation. The main hypothesis of this comparative chapter is therefore that the modalities of financial intermediation are reconfigured rather than removed in DeFi.

To do so, the comparison will be structured around several essential dimensions of financial intermediation: the allocation of funds and the provision of liquidity, information management and borrower selection, risk management and stability mechanisms, as well as forms of governance and the production of trust (Freixas & Rochet, 2008). This approach makes it possible to highlight their fundamental economic differences, but also their functional continuities.

2.3.2. The Transformation of Traditional Intermediation Functions

2.3.2.1. Fund Allocation and Liquidity Provision

The allocation of funds and the provision of liquidity are major functions of financial intermediation, as they make it possible to connect agents with financing capacity and those who need financing (*Freixas & Rochet, 2008; Allen & Santomero, 2001*). These two functions are found both in the traditional banking system and in decentralized finance, although their underlying mechanisms differ profoundly.

In the TradFi system, unlike in DeFi, the allocation of funds is fundamentally linked to the collection of deposits, which are then granted to households and firms in the form of credit (*Freixas & Rochet, 2008*). By financing relatively illiquid and long-term assets with liquid and short-term liabilities, banks carry out maturity, liquidity and risk transformation (*Gorton & Winton, 2003; Freixas & Rochet, 2008*). It is thanks to this transformation capacity that banks are able to provide immediate liquidity to depositors while financing the real economy, particularly agents who do not necessarily have liquid assets or sufficient collateral (*Diamond & Dybvig, 1983; Freixas & Rochet, 2008*).

In decentralized finance, by contrast, the allocation of funds relies rather on mechanisms for pooling resources through liquidity pools and automated lending protocols, as explained in the previous chapter (*Schär, 2021; Auer et al., 2024*). Through predefined rules, users place their assets in smart contracts and thereby make them available to other participants (*Schär, 2021*). This allocation does not rely on the same logic as the banking model, which transforms the balance sheet through an intermediary that itself assumes credit risk, but rather on a system of asset pooling and automatic execution of transactions, with overcollateralization requirements often constituting a condition for access to credit (*Schär, 2021; ECB, 2022; Aramonte et al., 2022*).

The fundamental difference between the two models lies in the nature of the transformation performed. Banks transform liquid deposits into illiquid financing while assuming part of the risk (*Gorton & Winton, 2003; Freixas & Rochet, 2008*), whereas DeFi allocates funds without such transformation of maturity or risk (*Schär, 2021; ECB, 2022*).

This difference is not without practical implications. Indeed, the banking system is better able to finance agents lacking sufficient collateral, notably through the production of information and the credit relationship (*Bhattacharya & Thakor, 1993; Boot, 2000; Freixas & Rochet, 2008*). DeFi, by contrast, limits default risk at the protocol level through overcollateralization and automatic liquidation mechanisms, but at the cost of more restricted access to financing for certain agents (*Schär, 2021; ECB, 2022; Aramonte et al., 2022*).

The bank therefore acts as an active intermediary capable of transforming resources and financing the real economy, whereas DeFi is closer to an automated market infrastructure facilitating the circulation of liquidity between actors who already possess mobilizable assets. These two models rely on distinct allocation logics, although they pursue the same economic function of providing liquidity and allocating resources.

2.3.2.2. Information, Selection, and Relationship with the Borrower

Information management and borrower selection are also major dimensions of financial intermediation, insofar as credit markets are characterized by information asymmetries between lenders and borrowers. These informational frictions, such as adverse selection and moral hazard, complicate direct financing, which can become inefficient, and therefore require the existence of specialized intermediaries capable of producing and processing information (*Bhattacharya & Thakor, 1993; Freixas & Rochet, 2008*). It is on this point that the two models diverge most clearly.

In the banking system, the reduction of asymmetries relies on borrower selection, contract structuring and the guarantee of continuous monitoring of commitments, with the aim of reducing agency costs and improving credit allocation (*Bhattacharya & Thakor, 1993; Freixas & Rochet, 2008*). This role is part of a logic of "delegated monitoring", which consists in using banks, which exploit economies of scale in the generation of information and thus act on behalf of depositors (*Diamond, 1984*). Moreover, the accumulation of qualitative information, which is essential for credit decisions, largely takes place through long-term relationships with borrowers. This credit relationship gives banks a major comparative advantage in financing opaque agents, such as small and medium-sized enterprises, whose access to financial markets is often quite limited (*Boot, 2000; Freixas & Rochet, 2008*).

In decentralized finance, the methods of information management and borrower selection are entirely different. Unlike the traditional system, they do not rely on an individualized assessment of creditworthiness. Indeed, DeFi protocols do not produce an individualized credit assessment comparable to that carried out by banks and do not maintain a credit relationship between the different parties (*Aramonte et al., 2022*). Financing is accessible only under conditions resulting from predefined rules embedded in smart contracts. These are more generally overcollateralization requirements and automatic liquidation mechanisms, as mentioned earlier (*Schär, 2021; ECB, 2022*). In this framework, default risk is addressed ex ante through the presence of sufficient collateral, rather than through a prior analysis of the borrower's profile or through continuous monitoring (*Schär, 2021; ECB, 2022*). Although the transparency of on-chain data offers increased visibility over borrowers' positions and transactions, it does not fully replace the production of information on their individual quality (*Aramonte et al., 2022*).

The two models therefore fundamentally differ in the way they deal with information asymmetries. On the one hand, banks reduce these asymmetries through selection, monitoring and the credit relationship (*Bhattacharya & Thakor, 1993; Diamond, 1984; Boot, 2000*). On the other hand, DeFi tends to bypass them by proposing conditions that aim to standardize access to financing and by requiring immediately mobilizable collateral (S*chär, 2021; ECB, 2022*). In line with the previous point, the banking system is therefore able to finance agents with insufficient collateral, whereas DeFi restricts access to financing by limiting its exposure to default risk (*Boot, 2000; Freixas & Rochet, 2008; Schär, 2021*). Decentralized finance therefore partially replicates the function of intermediation, but without reproducing its informational dimension. It proposes an alternative modality of credit organization, based on automatic rules and collateral-based security, which remains less suited to the financing of activities characterized by strong informational opacity.

2.3.2.3. Risk Management, Discipline and Stability

Major differences can also be observed between the two models in terms of risk management, discipline and stability. This dimension is decisive, as it influences capital allocation, the behavior of agents and the overall resilience of the financial system (*Freixas & Rochet, 2008; Allen & Santomero, 2001*).

In the traditional banking model, risk-taking is inherent to intermediation activity. By transforming liquid deposits into long-term financing, banks are directly exposed to credit, liquidity and interest rate risks (*Freixas & Rochet, 2008; Gorton & Winton, 2003*). These risks are actively managed through mechanisms such as portfolio diversification and internal management systems (*Freixas & Rochet, 2008*). This management is complemented by a structured regulatory framework: capital requirements aim to absorb losses, while prudential regulation and supervision seek to limit excessively risky behavior (*Freixas & Rochet, 2008; Kashyap, Rajan & Stein, 2008; Van den Heuvel, 2008*). Moreover, market discipline mechanisms, such as possible reactions from depositors, may also contribute to moderating banks' risk-taking (*Calomiris & Kahn, 1991*).

In decentralized finance, the logic of risk management differs significantly. DeFi protocols secure transactions ex ante, mainly through overcollateralization and automatic liquidation mechanisms (*Schär, 2021; ECB, 2022; Aramonte et al., 2022*). Default risk is thus contained without relying on an individualized assessment of creditworthiness or on active monitoring (*Schär, 2021; ECB, 2022*). The execution of rules is ensured directly by the code, which makes adjustments immediate and systematic, but the stability of the system remains dependent on the value of collateral, market liquidity and the proper functioning of oracles (*Schär, 2021*). This automation nevertheless reduces the system's capacity for adaptation, insofar as adjustments cannot be modulated discretionarily according to the context. In addition, the stability of the protocol depends heavily on market conditions, particularly on the value of the assets used as collateral (*ECB, 2022; Aramonte et al., 2022*).

These differences translate directly into fragilities specific to each system. The banking system, although framed by stabilization mechanisms such as central bank intervention, deposit insurance and prudential regulation, remains vulnerable to crises of confidence that may lead to massive deposit withdrawals, due to maturity transformation and liquidity creation (*Diamond & Dybvig, 1983; Freixas & Rochet, 2008*). Decentralized finance, for its part, is not exposed to the same type of vulnerability linked to the banking balance sheet, but it remains sensitive to the volatility of assets used as collateral and to phenomena of cascading liquidations. In an environment characterized by automated and continuous adjustments, these mechanisms may amplify price movements and encourage procyclical dynamics (*Aramonte et al., 2022; ECB, 2022*).

Ultimately, risk management in these two models relies on very distinct conceptions. The banking system combines risk transformation, institutional supervision and stabilization mechanisms, whereas decentralized finance relies on automated rules and collateral-based security (*Freixas & Rochet, 2008; Schär, 2021*). This results in a partial shift of risk management toward the technological infrastructure. In both cases, the issue of stability remains central, which once again supports the idea that decentralized finance corresponds more to a reconfiguration of the modalities of intermediation than to its disappearance.

2.3.2.4. Governance, Trust, and the Nature of the Intermediary

The divergences between the two models are not limited to the economic functions analyzed so far; they also concern the modalities of governance, the sources of trust and the very nature of financial intermediaries. Comparing these dimensions is essential insofar as they are inseparable from the functioning of financial intermediation (*Freixas & Rochet, 2008; Allen & Santomero, 2001; Schär, 2021*). Indeed, intermediation does not only consist in transferring resources or managing risks; it also requires a framework of rules, mechanisms guaranteeing their application, as well as a sufficient level of trust to make exchanges possible.

In the banking model, this trust relies mainly on identifiable institutions that are legally responsible and embedded in a strict regulatory environment (*Freixas & Rochet, 2008*). Banks thus appear as centralized intermediaries whose authority rests both on their expertise, their prudential supervision and their capacity to enforce contracts within a defined legal framework (*Freixas & Rochet, 2008*). Although agency problems may exist between managers, shareholders and creditors, as emphasized by the literature on banking governance, this governance remains broadly hierarchical and unified (*Jensen & Meckling, 1976; Freixas &*

Rochet, 2008). The banking intermediary is therefore not merely a technical channel; it also constitutes a center of decision-making, control and responsibility.

Decentralized finance, for its part, relies on a different logic. Trust is no longer primarily placed in an institution, but in the protocol, the code and the blockchain infrastructure, which automatically execute predefined rules (*Schär, 2021*). The execution of transactions and contractual conditions no longer depends on a centralized authority, but on smart contracts and consensus mechanisms supposed to guarantee the integrity of the system (*Schär, 2021; BIS, 2021*). This does not, however, mean the absence of governance. DeFi protocols must also be updated, maintained and governed, often through token-based mechanisms or DAO-type [4]structures, which allow certain participants to influence the parameters of the protocol as well as its evolution (*Zetzsche et al., 2020*). Governance is therefore not removed, but displaced and fragmented (*BIS, 2023*).

This fragmentation requires a reconsideration of the nature of the intermediary in DeFi. Unlike the banking system, where intermediation functions are grouped within a single institution, DeFi distributes these functions among several components: protocols ensure the execution of rules, liquidity providers make funds available, oracles transmit external information, while developers, validators and interfaces often retain an important role in the effective functioning of the system (*BIS, 2023; Zetzsche et al., 2020*). From this perspective, the idea of total disintermediation appears partly misleading. As emphasized in the literature and already explained in the Section 2.2.3.2, DeFi is often marked by an "illusion of decentralization", insofar as certain forms of power concentration or organizational dependence persist despite the automation of financial functions (*Aramonte, Huang and Schrimpf, 2021*). The intermediary therefore does not disappear; rather, it ceases to be a unitary institution and takes the form of a distributed architecture.

In sum, the fundamental difference between the two models, in terms of governance, trust and the nature of intermediation, lies less in the presence or absence of an intermediary than in the way it is organized. The banking system relies on a centralized, hierarchical, responsible and

[4] Decentralised autonomous organization (DAO): *in theory, a decentralised application consisting of rules of operation that dictate who can execute a certain behaviour or make an upgrade. Code helps create an organisational structure intended to function without a centralised management structure.* (*BIS, 2023*).

legally regulated intermediary (*Freixas & Rochet, 2008; Jensen & Meckling, 1976*), whereas decentralized finance relies on a more modular, protocolized and partially distributed form of intermediation (*Schär, 2021; BIS, 2023*). This shift of trust, governance and responsibilities towards the protocol demonstrates, once again, that intermediation is not removed, but that its functions are redistributed between institutional and technical supports.

2.3.2.5. Substitution, Complementarity, or Reconfiguration?

The comparison conducted in this chapter confirms that the relationship between TradFi and DeFi cannot be understood as a simple opposition between replacement and preservation of the existing model. Although DeFi shares certain intermediation functions with the traditional model, such as the allocation of funds, the provision of liquidity and the execution of transactions, the mechanisms as well as the institutional framework differ widely. The question is therefore not whether DeFi removes intermediation, but rather how it partially substitutes for it, complements it or transforms its modalities.

The hypothesis of full substitution is, however, difficult to defend. The banking system retains specific advantages in several essential dimensions of intermediation. Indeed, it is particularly suited to financing agents lacking collateral, producing information on opaque borrowers, managing credit relationships, and transforming maturity and liquidity. DeFi, by contrast, is built on standardized mechanisms, overcollateralization, the automation of rules and a market logic suited to tokenized or easily mobilizable assets. Banking functions are therefore not entirely replaced, especially with regard to the financing of the real economy and the discretionary assessment of risk.

Nevertheless, DeFi does offer complementary modalities to the traditional system. The automation of certain functions, the reduction of the need for centralized intermediaries for execution, as well as its ability to make certain data more immediately observable, constitute a real organizational innovation. This is particularly the case for operations that are standardizable, programmable, continuously executable and based on digital assets. Despite this, complementarity remains limited, insofar as these advantages do not erase important constraints in terms of access to credit, stability and dependence on technical infrastructure.

Thus, supporting the hypothesis of this comparison, it is therefore the notion of reconfiguration that best accounts for the ongoing transformation. DeFi modifies the supports, mechanisms and forms of governance. It neither merely reproduces banking functions identically, nor technically substitutes for them. It is thus distinguished by protocol-based, automated, collateral-dependent and distributed intermediation, whereas the banking system relies rather on institutional, relational and legally regulated intermediation. From one model to the other, we therefore do not move from a system with intermediation to a system without intermediation, but rather towards a redistribution of its functions among institutions, protocols, infrastructures and coded rules.

Ultimately, the comparative analysis conducted in this chapter leads us to consider decentralized finance as a real transformation of the modalities of financial intermediation, rather than as a replacement for the banking model. We thus move beyond a simple binary opposition between intermediation and disintermediation. These two models have their own advantages and limitations, and their coexistence suggests that the contemporary evolution of finance is not a total rupture, but a progressive recomposition of functions previously concentrated within banks. These functions can now be partially redistributed, automated or recombined within protocol-based infrastructures. It is within this framework that the following empirical part will attempt to show how these theoretical differences are concretely reflected in the observable characteristics of the two models.

3. Empirical Comparative Analysis of Financial Intermediation

3.1. Data, Scope and Methodological Limitations

After having explored the traditional banking system and decentralized finance through a literature-based approach, the second part of this dissertation consists in observing, from an empirical and comparative perspective, how these two models differ in the way they perform financial intermediation. This section also aims to assess the extent to which the arguments developed in the literature review are supported by the data. The objective is not to establish causal relationships, but to use observable indicators that make it possible to analyze several important dimensions of financial intermediation, such as the pricing of intermediation, the transformation of deposited funds into real financing, as well as risk management. These analyses aim to compare empirically the way in which similar financial functions can be carried out in distinct models that rely neither on the same mechanisms nor on the same promises. The data used, drawn from decentralized finance and the TradFi system, therefore do not claim to offer a perfect level of comparability, but serve as proxies in order to highlight trends, orders of magnitude, and ratios that allow for a structural comparison of the two models.

As regards the data scope for DeFi, the choice was made to limit the analysis to the USDT, USDC, and EURC assets traded on the Ethereum chain and using the Aave protocol. This scope is explained by the particular relevance it offers for the comparison. First, USDT and USDC are both stablecoins issued by two different entities, Tether for USDT and Circle for USDC, but both are designed to remain stable against the US dollar (*Barthélemy, Gardin & Nguyen, 2025*). This is why 1 USDC/USDT ≈ 1 dollar. EURC is also a stablecoin, but it remains stable against the euro. This asset was included in order to observe the evolution of its borrowing and deposit rates and compare them with European banking rates. These three assets appear particularly relevant for a comparison with the traditional banking system because of their peg to fiat currencies.

The second methodological choice is to focus on the Aave protocol. This choice is justified by Aave's undisputed leadership in the DeFi ecosystem, and more particularly in lending. Indeed, *Figure A1* shows that at the end of 2025, Aave held more than 50 billion dollars in Total Value Locked, corresponding to nearly 60% of the market share of deposited amounts in DeFi lending, thus far surpassing the other protocols (*Author's calculations based on Token Terminal data)*. In addition, Aave represented around 65% of active loans in DeFi over the same period (*Figure A2*). Beyond the protocol itself, the choice was also made to limit the analysis to the Ethereum chain, which, in addition to being the second-largest cryptocurrency by market capitalization (CoinMarketCap, n.d.), is also by far the most widely used chain in the DeFi ecosystem, hosting, for example, 77% of active loans at the end of 2025 (*Figure A3*). The objective is therefore to gather the most relevant, representative, and dominant elements of decentralized finance, without seeking to cover this universe in its entirety.

The main DeFi variables retained for this empirical comparison are borrowing and deposit rates, borrowed amounts, deposited amounts, as well as the utilization rate. The maximum Loan-to-Value ratios, the liquidation thresholds, and the liquidity penalties of USDT and USDC were also collected in order to highlight the risk management mechanisms integrated into the Aave protocol and to explain the relationship between collateral, borrowing capacity, and liquidity usage. These various data come from platforms specialized in the analysis of cryptocurrencies and DeFi, such as Aave.com, Artemis Analytics, Token Terminal, and Aavescan.

With regard to the traditional banking system, the decision was made to limit the analysis to European banking data by relying on data from the European Central Bank. This choice aims to ensure a certain degree of consistency and homogeneity in the data mobilized. The selected variables are borrowing and deposit rates applied to non-financial corporations, the amounts of loans granted to these firms, as well as the amounts of deposits placed by these same agents. The loan-to-deposit ratios of non-financial corporations and significant institutions, as well as the NPL ratios of significant institutions, are also used. The use of data relating to non-financial corporations aims to provide a more targeted proxy for intermediation directed toward the real economy, while excluding as much as possible the effects specific to the balance sheets of the financial sector. As with the DeFi data, these indicators make it possible to observe the remuneration of deposits, the cost of credit, the degree to which deposits are transformed into loans, as well as the treatment of deteriorated credit risks.

The research scope is deliberately limited. The objective is not to cover the entire DeFi ecosystem and the entire banking system, but to use a set of variables allowing for a representative comparison, by focusing on one protocol, one chain, and a few specific stablecoins for DeFi, and on aggregated data from the European banking system on the TradFi side.

However, several limitations must be mentioned. First, the data may sometimes differ in terms of frequency and time horizon. The DeFi variables were collected at a daily frequency over a relatively short recent period, whereas most banking indicators are available at a quarterly or monthly frequency over much longer time horizons. Although the comparisons conducted rely on coherent timeframes, a limitation remains regarding the time horizon of freely accessible data, particularly for DeFi, where certain variables, such as deposited and borrowed amounts, are only available over a period of approximately one year. Several comparisons must therefore be interpreted as short-term analyses.

A second limitation is the divergence in unit of account across the datasets. This is particularly the case between banking data expressed in euros and stablecoin data relating to dollar-pegged stablecoins such as USDT and USDC. This difference partially reduces comparability from a monetary perspective. Under a logic of strict monetary consistency, USDT and USDC would be better compared with US banking data. However, in order not to omit this dimension entirely, the rates of the EURC stablecoin are also included in the first comparison in order to observe their gap with European banking market rates on the basis of a common currency. In addition, the empirical analysis places greater emphasis on internal ratios, relative evolutions, and structural interpretation than on the raw comparison of volumes. In this logic, indicators such as the utilization rate in DeFi and the banking loan-to-deposit ratio are not treated as strictly identical metrics, but as analogous indicators of the way each system transforms available liquidity into effective financing.

A third limitation is that the populations observed in each system are not perfectly comparable. While banking data make it possible to identify precise institutional categories, such as non-financial corporations, DeFi data potentially group together a more heterogeneous set of market participants, and possibly certain non-financial entities as well (BIS, 2023; Chiu et al., 2024). The comparison is therefore not conducted at the level of perfectly matched categories of agents, but at the level of the financial functions and intermediation mechanisms observed.

Overall, these limitations imply that this analysis should be understood as a structured comparative exercise, rather than as a perfectly standardized statistical matching between the two systems. The objective is not to claim that DeFi and TradFi can be measured using identical variables, but to highlight that, despite significant differences in structure and institutional organization, the comparison of a selected set of indicators nevertheless makes it possible to reveal meaningful contrasts in the way financial intermediation is organized, priced, and constrained in each system.

3.2. Pricing of Intermediation: Interest Rates in DeFi and Banking

The objective of this first analysis is to compare the price of financial intermediation between DeFi and TradFi. To this end, this section uses, on the one hand, the borrowing and deposit rates of the USDT, USDC from April 2025 to April 2026 and EURC assets from July 2025 to April 2026 for DeFi, and, on the other hand, the European borrowing and deposit rates applied to non-financial corporations for the banking system. More precisely, the main variable retained for banking deposit rates is the overnight rate for non-financial corporations. Deposit rates with agreed maturity are also mobilized, but as complementary indicators allowing the interpretations to be nuanced. In addition, as developed in section 3.1, the observed results must be interpreted as a comparison of pricing mechanisms rather than as a perfect comparison between strictly equivalent indicators. The integration of EURC into the data makes it possible to partially resolve the limitation of monetary comparability by introducing a stablecoin pegged to the euro.

At the level of borrowing rates, the data indicate that those of DeFi are constantly higher than those of the banking system, even if this trend tends to reverse over the last few months, as shown in *Figure 1*. We observe that banking rates vary between 3.5% and 3.8%, whereas DeFi rates appear much more volatile over the period, fluctuating between 4% and 6.5%. The data available for EURC present the same general pattern of rate variations as the other stablecoins, which makes it possible to nuance the idea according to which a convergence with short-term banking rates could be justified solely by the existence of a common reference currency.

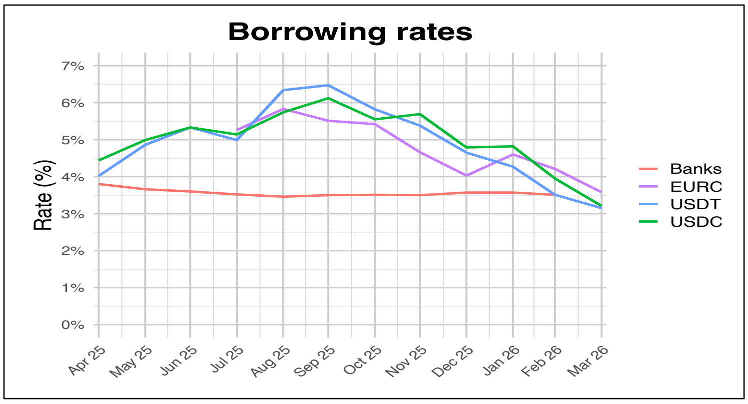


***Figure 1**: Borrowing rates*

Source: Author's calculations based on Aave and ECB Data Portal

In *Figure 1*, presented above, it can be observed that DeFi does not offer, over the observed period, less costly credit conditions than those of traditional finance. On the contrary, DeFi rates appear higher and clearly less stable in the short term. This volatility appears consistent with the idea developed in the literature review according to which protocol-based intermediation reacts more strongly to factors such as internal liquidity movements, market demand, and the use of the funds made available, rather than being smoothed by balance sheet management and the pricing practices specific to banking institutions (*Schär, 2021; Auer et al., 2024*).

The same trend is observed with regard to liquidity deposit rates on the Aave protocol, as illustrated by *Figure 2*. Here again, DeFi presents markedly higher rates, ranging between 2% and 5%, whereas the ECB data reveal rather low overnight deposit rates, between 0.5% and 0.6%. USDT and USDC follow a dynamic similar to that observed for borrowing rates, while EURC, which is the stablecoin with the rates closest to the banking sector, still remains well above them.

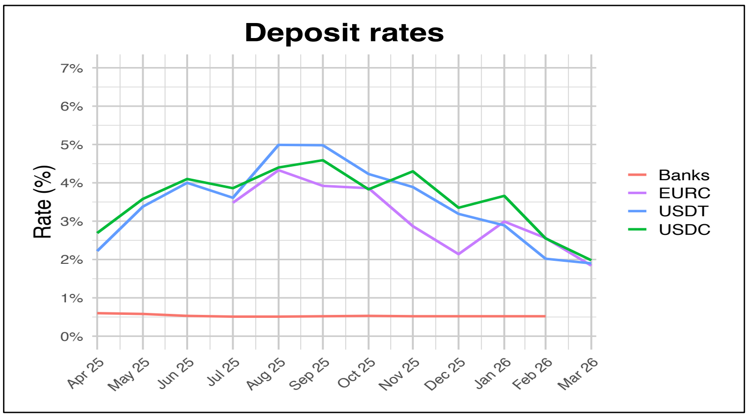


***Figure 2**: Deposit rates,*

Source: Author's calculations based on Aave and ECB Data Portal

These results seem to reveal that, over the period analyzed, DeFi offers a remuneration for liquidity that is significantly higher than that proposed by the traditional system. This difference can, once again, notably be explained by the structure of intermediation in the DeFi ecosystem and, more particularly, by a pricing mechanism that is much more sensitive to the market and to the level of demand, as explained in the literature review (*Schär, 2021; Auer et al., 2024*). By contrast, banking rates display much more rigid and compressed behavior, due to their integration into a broader institutional framework, especially visible in the case of overnight rates (*Freixas & Rochet, 2008*). Indeed, when banking deposit rates with agreed maturity are used, the data indicate that these rates are higher than overnight rates, fluctuating between 1.9% and 2.15% (*Figure A4*). They nevertheless remain below DeFi rates, and therefore do not alter the general interpretation. Overall, this comparison of deposit rates seems to reveal a more direct relationship between liquidity provision and remuneration in decentralized finance.

The data compared so far also make it possible to evaluate the real cost of intermediation for each model through the analysis of banking and DeFi spreads, shown in *Figure 3*. These spreads are calculated by the difference between borrowing rates and deposit rates. The comparison highlights that the banking spread exceeds the one observed in DeFi, which is consistent with the results of the previous analyses, which highlighted very low overnight deposit rates as well as high remuneration rates for the provision of liquidity in stablecoins on the Aave protocol. With regard to USDT and USDC, the spread generally fluctuates around 1.3%–1.7%. EURC, for its part, presents slightly higher spreads, but still within an order of magnitude similar to that of the two other stablecoins. On the other hand, the banking spread remains higher, at around 3%, when it is calculated as the difference between borrowing rates and overnight deposit rates. *Figure A5* illustrates the gaps between the spreads of each stablecoin and banking spreads, thereby allowing the evolution of these gaps over the period to be observed, varying between -1.2% and -1.89%.

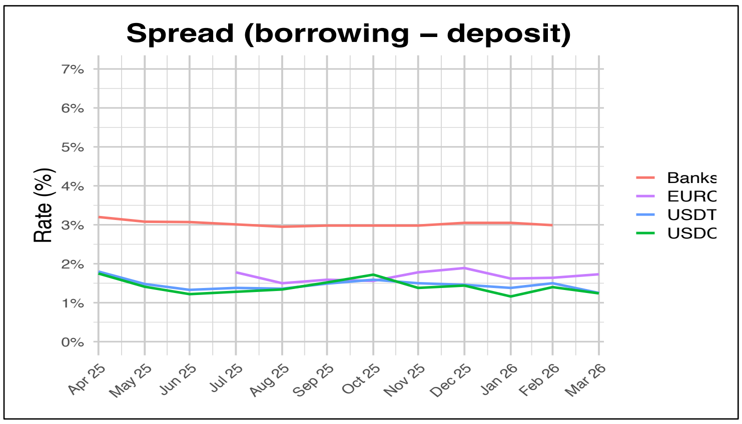


***Figure 3**: Spread (borrow-deposit)*

Source: Author's calculations based on Aave and ECB Data Portal

These results indicate that the gap between the cost of borrowing and the remuneration for liquidity provision is structurally larger in the banking system than in the protocol studied. In DeFi, borrowing rates and deposit rates appear to evolve jointly, which contrasts with the banking system, where the spread remains wider and more stable.

In order to preserve the rigor of this analysis, it is important to nuance the results. Indeed, the level of the spread depends on the banking indicators chosen. In this case, these are the borrowing rates and overnight deposit rates of non-financial corporations. This category has strong indicative value and serves as a relevant proxy for the comparison with DeFi. However, it cannot be considered a representation of the entire banking segment. For example, when agreed maturity deposit rates are mobilized, it can be observed that the spread gap with DeFi is markedly smaller. Moreover, with these rates, the level of the EURC spread tends to align with, and even slightly surpass, that of the European banking sector at certain periods (*Figure A6*). Nevertheless, the comparison remains instructive. The observations suggest that, over the period covered, pricing within DeFi appears narrower and more directly linked to liquidity conditions than in the banking system.

The various observations made above are confirmed in *Figure 4*. This figure indicates that the standard deviation of DeFi borrowing rates, ranging from 0.62% to 0.92%, is 6 to 9 times higher than that observed in the banking system (0.10%). The difference is even more striking for deposit rates, where DeFi volatility is 20 to 30 times higher than that of overnight banking rates. These figures illustrate how the different pricing logics between the two systems translate into reality. Where banking rates are smoothed by an institutional and balance-sheet framework, DeFi rates directly and almost instantaneously reflect liquidity conditions.

Figure 4*: Summary statistics, borrow rates, deposit rates and spreads*
(EURC: July 2025-February 2026 ; USDT, USDC, Banks: April 2025-February 2026)

	Borrow rates				Deposit rates					Spreads				
	EURC	USDT	USDC	BANKS	EURC	USDT	USDC	BANKS rate overnight	BANKS agreed maturity	EURC	USDT	USDC	BANKS overnight	BANKS agreed maturity
min	4,03%	3,57%	4,03%	3,46%	2,14%	2,07%	2,64%	0,51%	1,89%	1,50%	1,33%	1,16%	2,95%	1,57%
max	5,83%	6,47%	6,12%	3,80%	4,33%	4,99%	4,59%	0,60%	2,16%	1,89%	1,80%	1,75%	3,20%	1,66%
median	4,96%	4,99%	5,14%	3,52%	3,24%	3,61%	3,83%	0,52%	1,91%	1,63%	1,48%	1,39%	3,01%	1,61%
average	4,94%	5,06%	5,15%	3,56%	3,27%	3,44%	3,58%	0,53%	1,95%	1,67%	1,46%	1,41%	3,03%	1,61%
standard deviation	0,66%	0,92%	0,62%	0,10%	0,75%	0,97%	0,64%	0,03%	0,08%	0,13%	0,13%	0,19%	0,07%	0,03%

Source: Author's calculations based on Aave data and ECB Data Portal

The analysis of this section, devoted to the cost of financial intermediation in decentralized finance and in traditional finance, provides several relevant indications regarding the differences in functioning between these two models. The first observation is that, although both systems do assign a cost to borrowing and a remuneration to deposited funds, they do so according to distinct institutional logics. On the one hand, the data reflect a relative stability of banking system rates over time, which appears consistent with a form of intermediation in which pricing is embedded in a broader management of the balance sheet, customer relationships, and strategic considerations. On the other hand, DeFi presents higher rates and greater volatility, which may suggest a market that is more reactive and more sensitive to factors such as available liquidity and demand. This is consistent with what was explained in section 2.2.2 of the literature review regarding the algorithmic functioning of pricing. Additional individual views of banking rates and stablecoin rates are provided in *Figures A7 to A11*. These figures make it possible to observe borrowing rates, supply or deposit rates, and spreads separately for each variable, and further illustrate the more volatile and market-sensitive pricing dynamics observed in DeFi compared with the more gradual adjustment of banking rates.

The results obtained therefore support the thesis defended in this dissertation, according to which financial intermediation is not eliminated in the DeFi environment, but reconfigured. This reconfiguration notably takes place through automated pricing methods and through adjustments that are more directly linked to market conditions. This reading is also reinforced by the analysis of spreads. Indeed, the fact that the spreads observed in DeFi are lower and more volatile than those of the banking sector may once again suggest that intermediation there is priced in a more direct and automatic manner. By contrast, the banking system seems to incorporate a thicker institutional layer between depositors and borrowers. Thus, this comparison supports the idea that DeFi neither replaces nor suppresses financial intermediation, but reconfigures its modalities of organization and pricing.

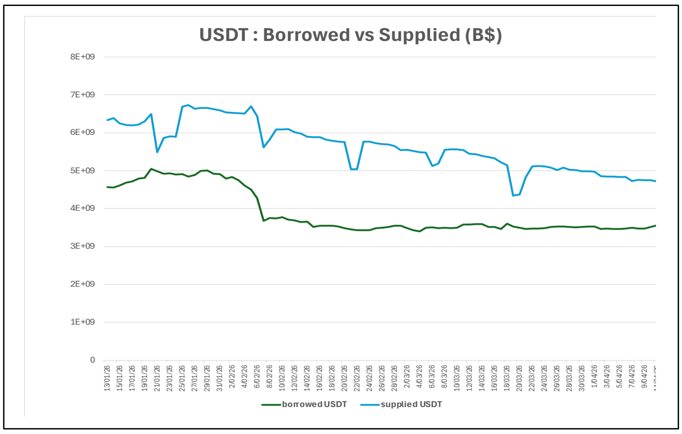
3.3. Liquidity Allocation and Transformation

This section aims to examine how liquidity is allocated and transformed into real financing in the decentralized financial model as well as in the TradFi system. The purpose is therefore to analyze to what extent the resources provided to these models are actually converted into loans, and to what extent the empirical observations can be connected to the theoretical concepts developed in the literature review.

To do so, several datasets are used. On the DeFi side, the analysis is based on the amounts of USDT and USDC deposited and borrowed, as well as on the utilization rates of these amounts between 13 January 2026 and 12 April 2026, covering a three-month period. On the banking side, the amounts deposited by non-financial corporations, as well as the amounts lent to this same category over the period from June 2015 to December 2025, were collected and serve as proxies. On the basis of these two variables, the loan-to-deposit ratio for this category is easily calculated through the ratio between borrowed amounts and deposited amounts. Although the data used for DeFi and for the banking system do not cover exactly the same period, the analysis remains relevant given that it focuses primarily on structural differences. In addition, in order to strengthen the robustness of the interpretations, the loan-to-deposit ratios of European significant institutions were added to the comparative analysis. This latter indicator differs from the non-financial corporations category insofar as it includes, in addition to this category, households, which makes it possible to have a more global view of the transformation of funds within the banking sector. This broader scope probably makes it a more relevant indicator for comparison with DeFi.

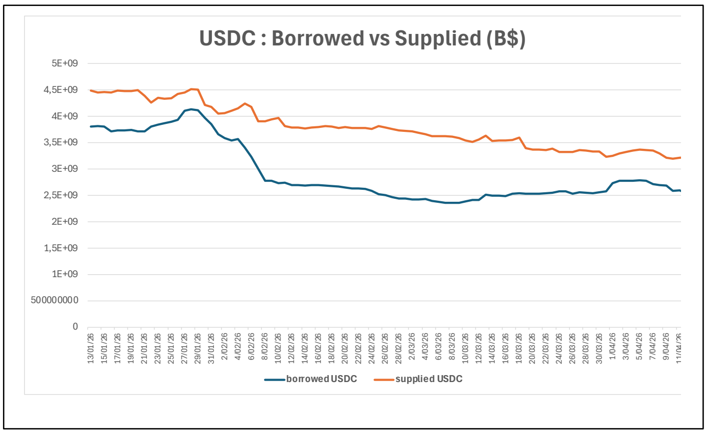
First, *Figures 5 and 6* reveal that the amounts of funds supplied in both USDT and USDC on the Aave protocol remain permanently higher than the amounts actually borrowed. This suggests that, in decentralized intermediation, the loans granted by the Aave protocol depend beforehand on the liquidity collected and that the total amount of deposited liquidity is not fully transformed into credit. Indeed, the variations in borrowed and deposited amounts evolve jointly without ever crossing. There therefore remains, at all times, a share of the funds supplied that is not borrowed and remains available in the pool.

***Figure 5**: USDT, Borrowed vs Supplied, B$*



Source: Author's calculations based on Aavescan

***Figure 6**: USDC, Borrowed vs Supplied, B$*



Source: Author's calculations based on Aavescan

The same phenomenon can be observed through the utilization rates of these two assets. The objective of this metric is to indicate the share of supplied liquidity that is effectively transformed into loans. *Figure 7* thus shows that, for both stablecoins, the utilization rate remains constantly below 100%, with an average of 69.11% for USDT and 76.69% for USDC. USDT therefore presents a slightly lower general level of liquidity transformation intensity than

USDC over the period observed. Nevertheless, in both cases, the data clearly show that a share of the amounts supplied in the decentralized environment is not converted into credit.

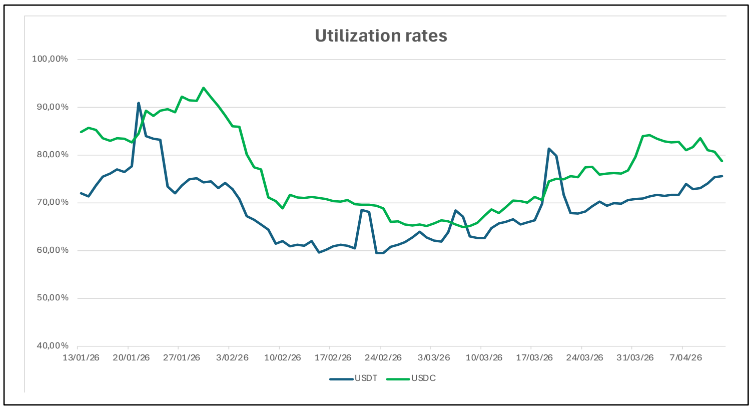
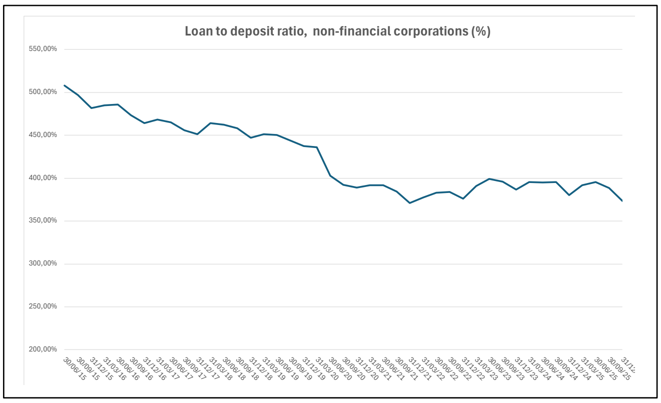


***Figure** 7: Utilization Rates*

Source: Author's calculations based on Aavescan

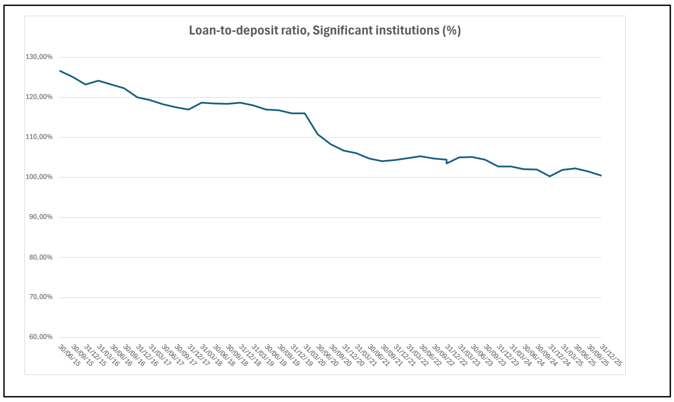
By contrast, the analyses carried out on the banking sector reveal a different logic of transformation. As *Figures 8 and 9* show, the loan-to-deposit ratios, both for non-financial corporations and for significant institutions, remain systematically above 100% over the period analyzed, sometimes by a wide margin. For non-financial corporations, this level ranges between 508% and 371%, which is substantially higher than the loan-to-deposit ratio of significant institutions, which fluctuates between 126% and 100%. Although the trend is downward in both cases, the difference remains significant not only between these two banking indicators, but also relative to the utilization rates observed in DeFi. These data suggest that the banking system performs liquidity transformation in a much more extensive and flexible way than decentralized finance.

***Figure 8**: Loan-to-deposit, non-financial corporations*



Source: Author's calculations based on ECB Data Portal

***Figure 9**: Loan-to-deposit, significant institutions*



Source: Author's calculations based on ECB Data Portal

This last point highlights a major structural difference between decentralized finance and the banking system, already addressed in points 2.1.1 and 2.1.2 of the literature review. Indeed, one of the characteristics of the traditional system is that credit allocation is based on borrower selection, information production, as well as on a differentiation of profiles and activities. By contrast, DeFi structures access to financing through liquidity pools, standardized rules, and the use of collateral. This functioning operates without individual selection or a credit relationship comparable to the one practiced in the traditional banking environment. In this framework, indicators such as the utilization rate measure the general intensity of the use of the liquidity pool, rather than a credit allocation by categories of agents, as is the case in TradFi.

Another element developed in the literature review supports the observation that DeFi utilization rates remain below 100%. As was seen in points 2.2.2 and 3.2, the pricing of decentralized finance operates on an algorithmic basis depending on market conditions and protocol parameters. Thus, when the demand for the use of an asset increases relative to the reserves available in the liquidity pool, borrowing rates increase according to the reserves available in that same pool, and vice versa. This mechanism aims to adjust the incentives of lenders and borrowers in order to preserve the equilibrium of the system and the continuity of the lending service (Schär, 2021; Auer et al., 2024). This particular structure largely helps explain why it is very difficult for the decentralized system to reach a utilization rate that remains durably close to 100%.

Overall, the analyses carried out in this section suggest that DeFi does indeed perform a fund allocation function, but that this allocation does not correspond to a balance-sheet transformation comparable to that carried out by banks. As developed above, the banking sector mobilizes a broader balance-sheet structure, which enables it to transform collected resources into loans in a more extensive way. By contrast, DeFi relies on a logic of pre-funding as well as on a limited use of the resources available in the pools. These structural differences suggest, once again, that financial intermediation is not suppressed in DeFi, but put into a more standardized form and one more directly connected to the reserves actually available.

3.4. Risk Management and Credit Deterioration

In this final section, the analysis focuses on the structural comparison of the ways in which credit risk is managed on the basis of the data available for each model. It also aims to examine the way in which credit deterioration appears in the traditional banking model and in decentralized finance. In this context, several indicators are mobilized as proxies. On the banking side, the analysis relies on the non-performing loans of European significant institutions between 2020 and 2025, which designates "*the share of bank claims whose repayment is unlikely or overdue by more than 90 days*" (ECB, n.d.). On the DeFi side, risk management indicators such as the loan-to-value, the liquidation threshold, and the liquidation penalty are used for the stablecoins USDT and USDC within the Aave protocol. As explained in point 2.2.2, the LTV indicates the maximum level that can be borrowed from a given collateral, and it corresponds to the ratio between the borrowed value and the value of the deposited collateral. The liquidation threshold designates the threshold from which the position becomes eligible for liquidation, that is to say, the critical level beyond which the relationship between the debt and the value of the collateral is no longer considered sustainable by the protocol. Finally, the liquidation penalty, which had not been mentioned previously, corresponds to the penalty applied during a liquidation, that is to say, the discount borne by the borrower when the collateral is liquidated according to the parameters of the Aave protocol (Aave, n.d.). The objective is not to compare information such as the NPL with DeFi risk indicators, since they are not of the same nature, but rather to illustrate the major differences in the management of credit risk in the two systems.

On the banking side, the NPL indicator presented in *Figure 10* reveals that the presence of risk remains durably embedded in the balance sheets of banking institutions. The data nevertheless show a decline over the observed period, with the ratio falling from 3.4% in 2020 to just over 2.1% in 2025, which may suggest a potential improvement in credit quality during the period. These results nevertheless indicate that the banking system carries deteriorated claims over time, thus showing that credit risk can materialize and remain visible in banking balance sheets. This illustration confirms that credit risk constitutes a real exposure of banking intermediation and appears consistent with the concepts of institutional constraints, capital requirements, and prudential supervision mentioned in the literature review.

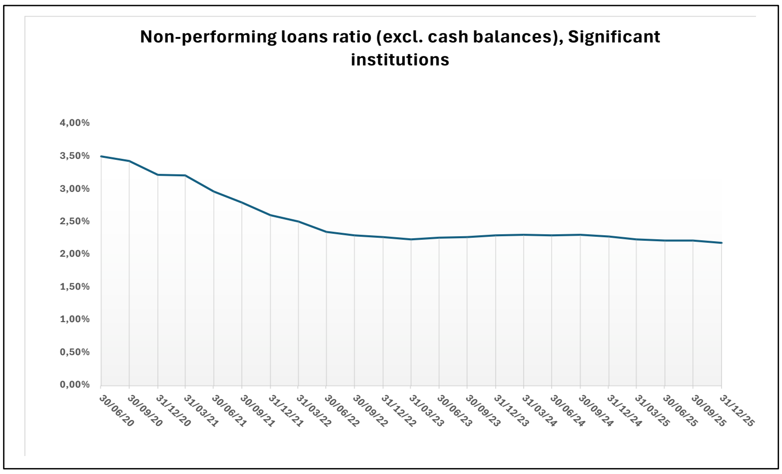


***Figure 10**: NPL ratio, significant institutions*

Source: Author's calculations based on ECB Data Portal

In DeFi, the logic differs significantly. As discussed in section 2.2.2 of the literature review, this financial model regulates access to credit through several predefined parameters such as overcollateralization, loan-to-value ratios, and automatic liquidation thresholds. The data collected for the USDT and USDC reserves in the Aave protocol show in *Figure 11* that, in both cases, the LTV is limited to 75% and the liquidation threshold to 78%. The liquidation penalty reaches, respectively, 5% and 4.5%. This means that when USDT or USDC are used as collateral, the borrower can only access a loan for a value of up to 75% of the value of the USDT or USDC deposited.

Figure 11*: LTV, liquidation threshold and Liquidation penalty (USDT & USDC)*

	Loan-to-value	**Liquidation threshold**	**Liquidation penalty**
USDT	*75%*	*78%*	*5%*
USDC	*75%*	*78%*	*4,5%*

Source: Aave Data

These parameters indicate that DeFi aims to treat risks ex ante by requiring a sufficient level of collateral and compliance with threshold levels, the crossing of which automatically triggers the liquidation of the position (Chiu et al., 2024). The absence of an indicator directly comparable to the NPL ratio therefore does not mean that risk does not exist, but rather that it is managed according to a different logic. These observed differences appear consistent with the literature review, according to which the banking model relies on a combination of mechanisms such as borrower selection, monitoring, market discipline, prudential regulation, and capital requirements in order to absorb potential losses. Within this framework, banks can bear and, to a certain extent, manage a deterioration in credit, even if this is reflected in the existence of non-performing loans. By contrast, DeFi, by its very nature, does not operate on the basis of credit information in the same way as banks and does not carry out individualized assessments. It constitutes an architecture of collateralized credit architecture in which risks are managed through the automation of rules, collateral, and liquidation thresholds (Aramonte et al., 2022; Chiu et al., 2024).

Risk is therefore treated in a more structural than discretionary manner. *Figure A12* highlights the total liquidation volumes that took place in the Aave protocol between 2023 and 2026 following the crossing of the threshold levels. These data indeed show that risk materializes in DeFi, but in the form of episodes of automated liquidation rather than as a stock of durably non-performing loans.

This comparison thus helps make observable, at the empirical level, the theoretical concepts developed in point 2.3.2.3. The two systems do indeed tend to manage risks, but according to deeply different approaches and means. Banks, for their part, seek to limit the impacts of credit defaults through a broader institutional framework of risk management. By contrast, the decentralized model aims to prevent these credit defaults from accumulating at the protocol level. To do so, it mobilizes pre-encoded mechanisms such as overcollateralization, liquidation thresholds, penalties, borrowing limits, and above all the automatic application of rules. These mechanisms make it possible to reconfigure financial intermediation by integrating it into the technical infrastructure itself.

4. Conclusion

The objective of this work was to identify how decentralized finance differs from the traditional banking system in terms of financial intermediation. To do so, the analysis first focused on a theoretical study of each system in order to build the framework for the comparison that followed. It then examined relevant empirical data to observe how the theoretical concepts discussed in the literature section are reflected in real data. This work did not seek to argue that one system is better than another, but rather to explore how their institutional, organizational and economic mechanisms differ in the performance of key financial intermediation functions.

The literature review first highlighted the functioning of financial intermediation in both the traditional banking system and decentralized finance. It showed that banks, in addition to connecting savers and borrowers, also produce information, select and monitor borrowers, transform maturities and resources, absorb risks and operate within a strict regulatory framework. Beyond their technical role, banks therefore perform essential informational, relational, prudential and legal functions. On the other hand, DeFi relies more on predefined rules integrated into protocols and executed automatically, without dependence on a centralized institution. The comparative part, based on the first two descriptive sections, then showed how the mechanisms used to perform key intermediation functions, such as liquidity provision, resource allocation, information production and borrower selection, risk management and governance, differ significantly between the two systems. Indeed, decentralized finance relies on an automated infrastructure integrating smart contracts, liquidity pools, decentralized exchanges, algorithmic interest-rate setting and collateral-based lending protocols. The research conducted in this work therefore showed that financial intermediation does not disappear in DeFi, but is redistributed among protocols, pre-encoded rules, liquidity providers, oracles and the blockchain infrastructure itself.

The empirical part supported this thesis through the different angles of analysis explored. It first studied the cost of intermediation between the traditional model and the decentralized model. The results indicate that both systems price intermediation, but according to different methods. Borrowing and deposit rates appear more stable in the traditional banking model, whereas greater volatility is observed in decentralized finance. These different observations are consistent with the literature review, which argues that the banking system is integrated into a broader institutional framework, while DeFi uses automated mechanisms directly dependent on the protocol, market demand and liquidity conditions. This suggests that DeFi does not remove pricing, but rather integrates it directly into the rules of the protocol.

The analysis of liquidity allocation also highlighted the structural differences between these two systems. In DeFi, the Aave protocol shows that the amount of liquidity supplied in liquidity pools is not entirely transformed into loans, which is directly visible in the utilization rates of USDT and USDC, which remain below 100% throughout the observed period. On the other hand, banking loan-to-deposit ratios are above this 100% threshold, particularly for non-financial corporations and significant institutions. These observations reflect the ability of banks to carry out broader balance sheet transformations by mobilizing deposits from multiple sources and redirecting them towards credit. Consequently, DeFi does provide liquidity and offer borrowing opportunities, but it does not carry out the same level of transformation as the traditional banking sector.

The third analysis, focusing on risk management, leads to the same conclusion. In the banking system, credit risk can materialize over time through non-performing loans, whose effects are mitigated by capital requirements, supervision, provisioning and institutional governance.
In DeFi, the approach differs: predefined rules in the protocol limit access to credit, as is the case, for example, with ratios such as loan-to-value, liquidation thresholds and liquidation penalties. Thus, risk is managed upstream through overcollateralization and automatic liquidation mechanisms. These measures make it possible to limit default risk, but they also have the consequence of restricting access to credit for those who do not have sufficient collateral and of exposing the system to the volatility of this same collateral, as well as to liquidation dynamics.

The empirical comparison conducted in this work relies on proxies rather than on perfectly equivalent indicators. The results must therefore be interpreted as a structural comparison rather than as a strict statistical equivalence between two financial systems. Nevertheless, they support the different ideas developed in the literature section and suggest that decentralized finance does not replace the traditional banking system. Banks retain significant advantages in the production of credit information, the financing of opaque borrowers, maturity and liquidity transformation, as well as the institutional absorption of risks. However, DeFi introduces real organizational innovations such as programmable execution, continuous access, increased transparency of certain on-chain activities and a more automated allocation of liquidity. For certain standardized, collateralized and digital financial activities, DeFi can therefore offer mechanisms that are complementary to those of TradFi. However, this complementarity remains limited by the system's dependence on collateral, technical infrastructures and governance mechanisms.

The answer to the research question is therefore that decentralized finance differs from traditional banks not because it removes intermediation, but rather because it modifies its form. On both sides, intermediation functions are present, but exercised through different tools and processes. Institutional, relational and legal intermediation on the traditional side, and protocol-based, automated, collateral-dependent and partially distributed intermediation on the decentralized side.

In my view, financial intermediation is only at the beginning of transformations that will not be limited to what decentralized finance offers today. Although this evolution depends on many regulatory and legislative factors, I believe that the coming years may reveal a banking system in transition, increasingly integrating intermediation solutions inspired by DeFi in order to address certain weaknesses of the current system. More generally, we can already observe a change in positioning among a large number of banks with regard to the blockchain environment and crypto-assets. Although, to date, this is most often limited to investment solutions offered to clients, I believe that this reflects a dynamic of progressive acceptance of this ecosystem by banking institutions. Furthermore, conducting additional comparative research between traditional and decentralized finance would be useful for deepening our understanding. This could involve a longer time horizon, an analysis of more protocols and multiple blockchains, as well as exploring the potential practical integration of DeFi into traditional finance.

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Appendices

The appendices below provide complementary visual material supporting the empirical analysis.

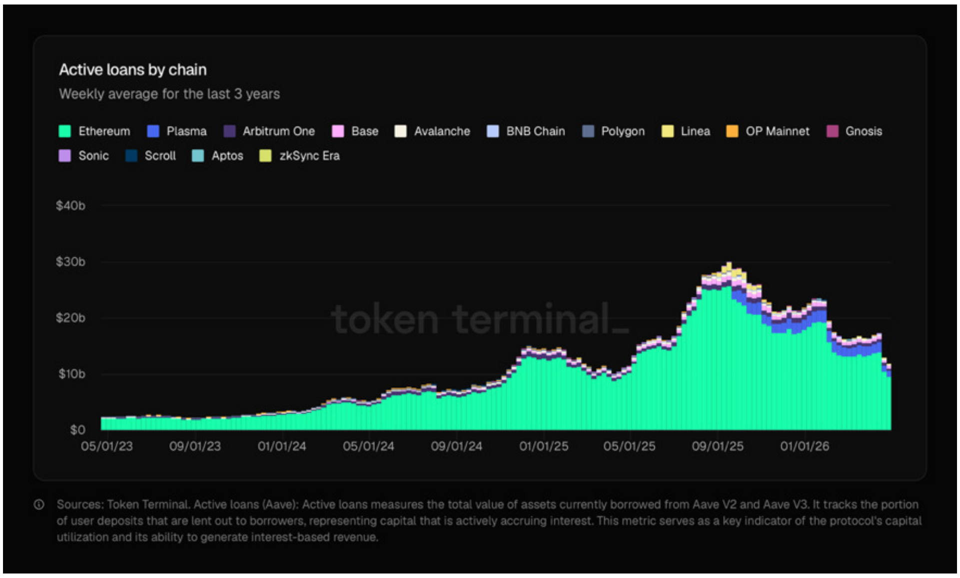
Figure A1*: Total value locked, B$, 2023-2026*

Source: Token Terminal

Figure A2*: Active loans, Aave vs Lending, B$, 2023-2026*

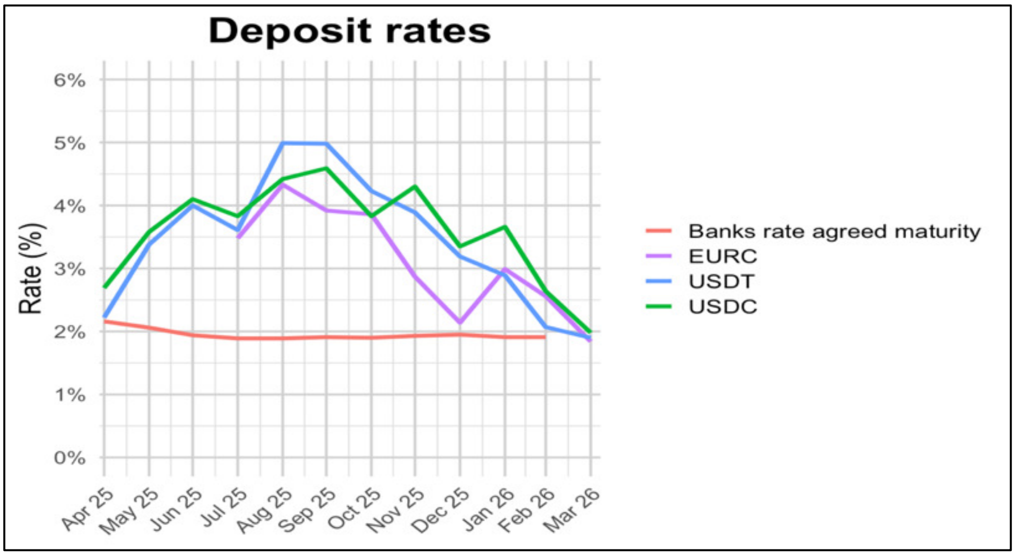
Source: Token Terminal

Figure A3: *Active loans by chain, B$, 2023-2026*



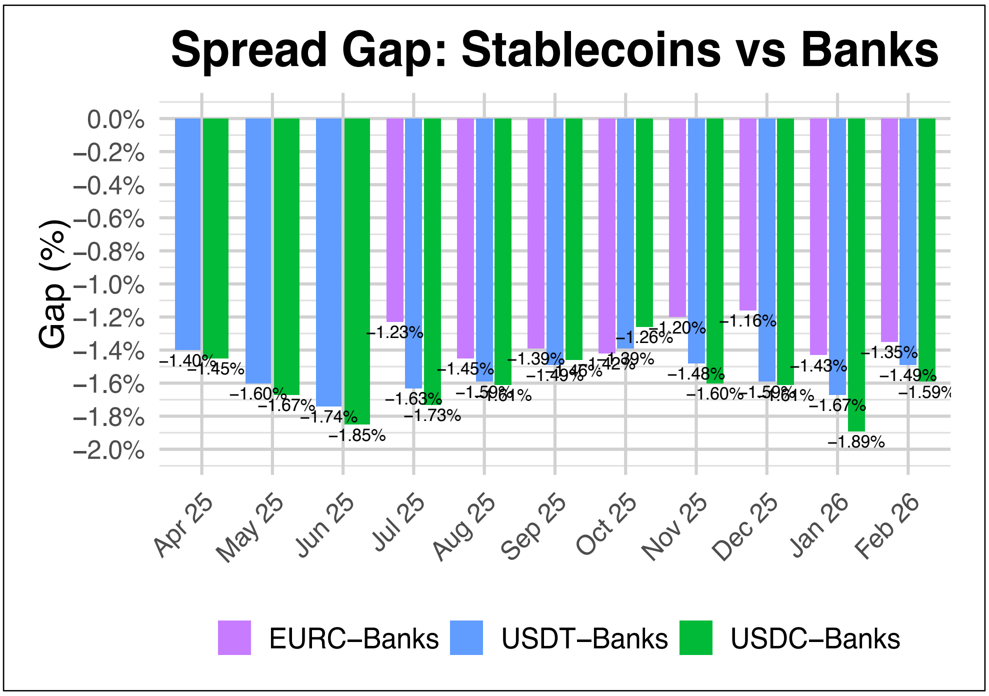
Source: Token Terminal

Figure A4: *Deposit rate using banks rates on agreed maturity*



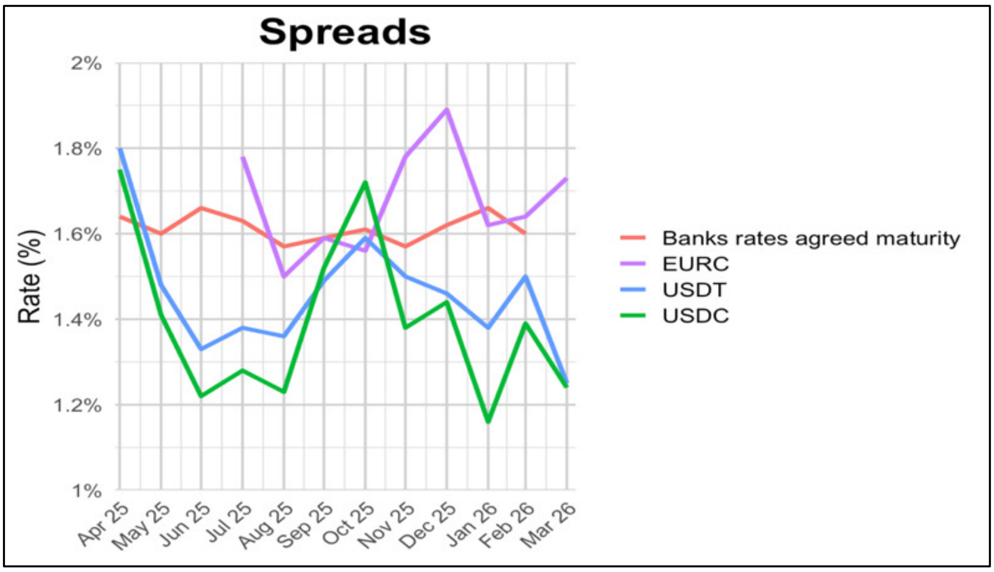
Source: Author's calculations based on Aave and ECB Data Portal

Figure A5: *Spread gap, Stablecoins-banks*



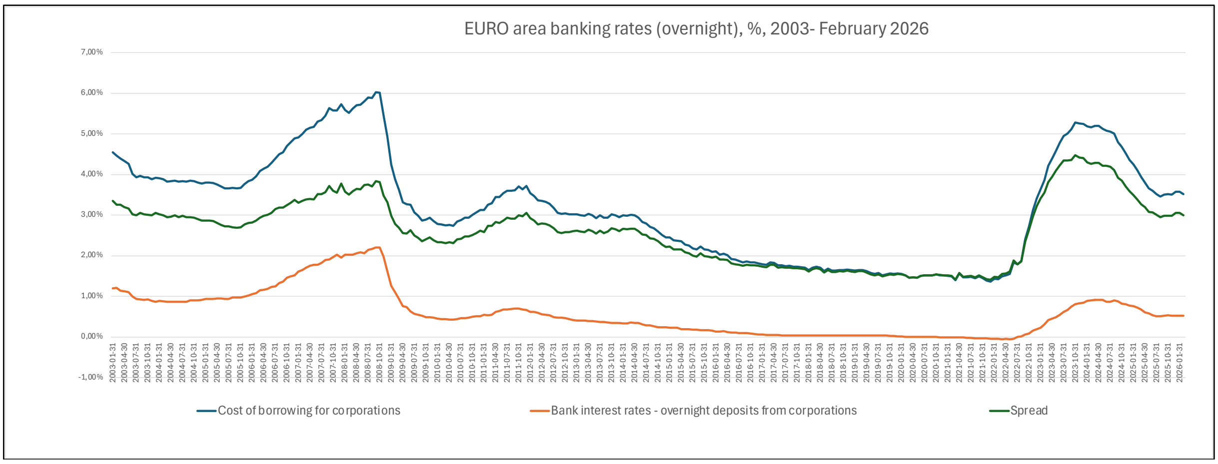
Source: Author's calculations based on Aave and ECB Data Portal

Figure A6: *Spreads with banks rates on agreed maturity*



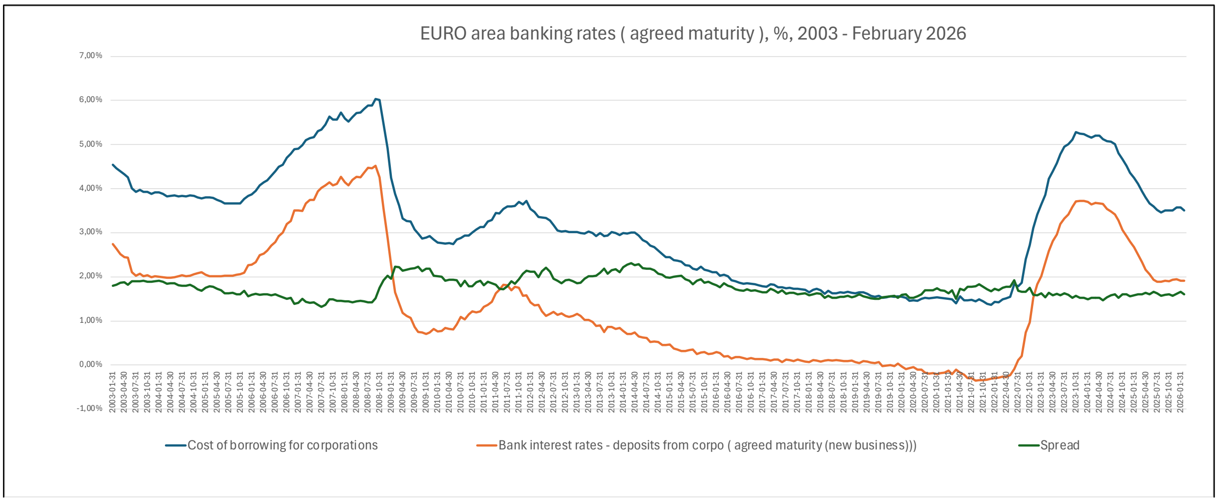
Source: Author's calculations based on Aave and ECB Data Portal

Figure A7: *Euro Area Banking Rates with Overnight Deposits, 2003–2026*



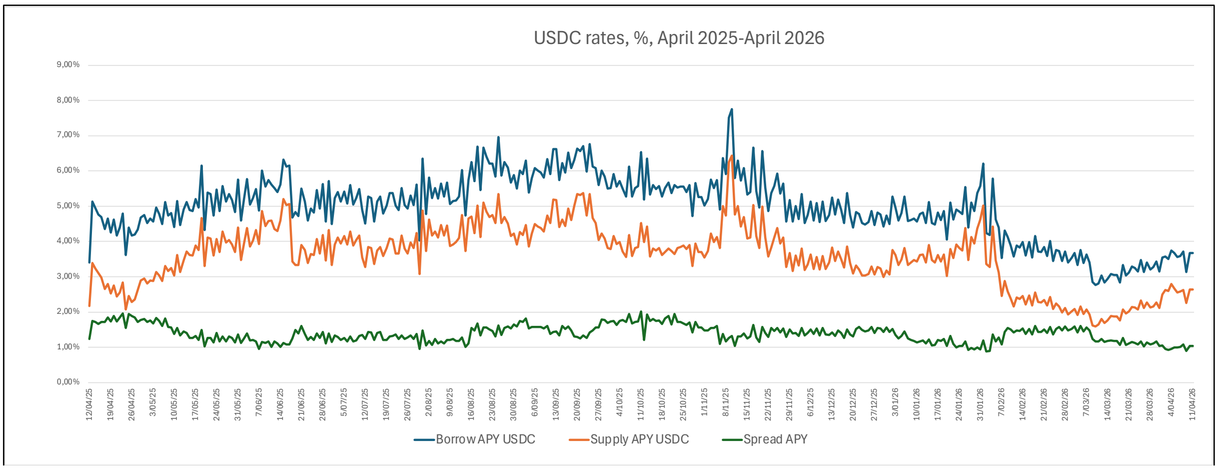
Source: Author's calculations based on ECB Data Portal

Figure A8: Euro Area Banking Rates with Agreed Maturity Deposits, 2003–2026



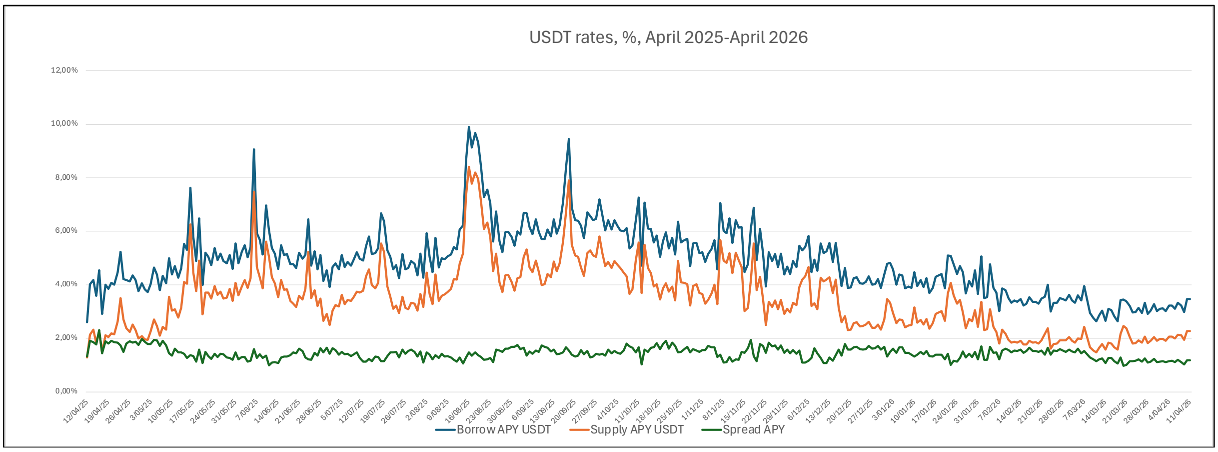
Source: Author's calculations based on ECB Data Portal

Figure A9: USDC Borrowing, Supply and Spread Rates on Aave, April 2025–April 2026



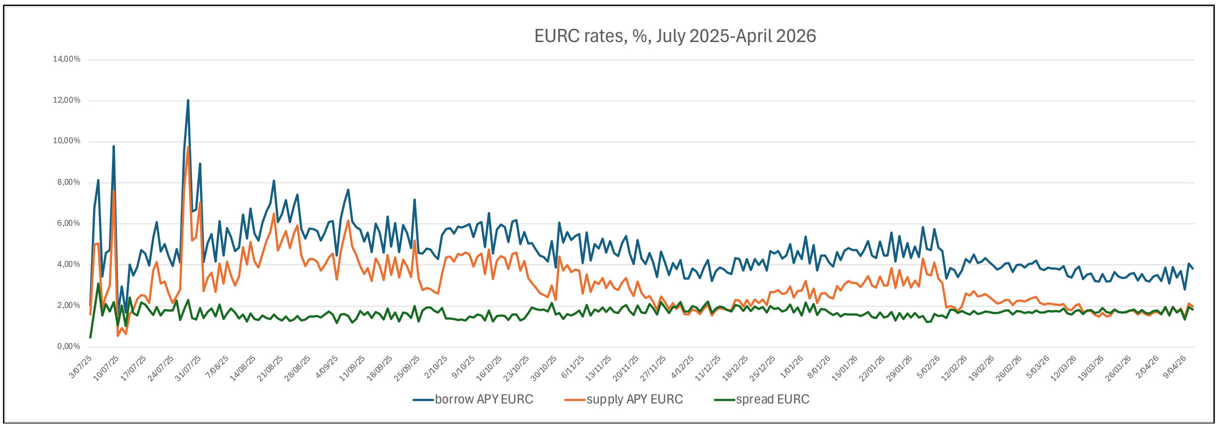
Source: Author's calculations based on Aave Data

Figure A10: USDT Borrowing, Supply and Spread Rates on Aave, April 2025–April 2026



Source: Author's calculations based on Aave Data

Figure A11: EURC Borrowing, Supply and Spread Rates on Aave, July 2025–April 2026



Source: Author's calculations based on Aave Data

Figure A12*:* Liquidation volume, Aave, 2023-2026

Source: Token Terminal