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# The Role of Decentralized Finance in Emerging Financial Services

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**ABSTRACT**

In recent years, a growing trend toward the decentralized financial system (DeFi) driven by blockchain and technological innovation put more emphasis on understanding of how the traditional financial system can encounter the ongoing and changing demands of a society evolving toward 4.0 and increasingly aiming to meet environmental, social, and governance sustainability criteria. To this aim, this paper provides a broad overview of blockchain technology, explores the DeFi ecosystem in the context of the current financial system, establishes a connection between DeFi and open banking, and offers some policy recommendations. Specifically, we aim to present all aspects of the corporate governance that can be improved through the adoption of decentralized form of blockchain technology to realize the full potential of the fourth industrial revolution. However, we also present the key drawbacks of blockchain that stakeholders should be aware of before implementing this technology. This paper further proposed a conceptual framework for adoption of blockchain technology capturing the complex relationships that exist between institutional, market and technical factors. In this regard, we demonstrate how organisations and regulators can leverage blockchain to improve business operations, enhance efficiency and reduce operational costs. We also conclude that DeFi still is a niche market with certain risks, but it has great potential in terms of efficiency, transparency, accessibility, and interoperability. As such, it may contribute to the development of a more reliable and transparent financial infrastructure.

Negli ultimi anni, una crescente tendenza verso il sistema finanziario decentralizzato (DeFi), guidata dalla blockchain e dall'innovazione tecnologica, ha posto maggiore enfasi sulla comprensione di come il sistema finanziario tradizionale possa fare fronte alle continue e mutevoli esigenze di una società che si evolve verso il 4.0 e punta sempre più a soddisfare criteri di sostenibilità ambientale, sociale e di governance. A tal fine, questo paper fornisce un'ampia panoramica della tecnologia blockchain, esplora l'ecosistema DeFi nel contesto dell'attuale sistema finanziario, stabilisce una connessione tra DeFi e open banking e offre alcune raccomandazioni politiche. In particolare, miriamo a presentare tutti gli aspetti della corporate governance che possono essere migliorati attraverso l'adozione di una forma

decentralizzata di tecnologia blockchain per realizzare il pieno potenziale della quarta rivoluzione industriale. Presentiamo, tuttavia, anche i principali svantaggi della blockchain di cui le parti interessate dovrebbero essere consapevoli prima di implementare questa tecnologia. Questa ricerca ha inoltre proposto un quadro concettuale per l'adozione della tecnologia blockchain evidenziando le complesse relazioni che esistono tra fattori istituzionali, di mercato e tecnici. A questo proposito, dimostriamo come le organizzazioni e le autorità di regolamentazione possono sfruttare la blockchain per migliorare le operazioni aziendali, aumentare l'efficienza e ridurre i costi operativi. Concludiamo osservando, inoltre, che la DeFi è ancora un mercato di nicchia con alcuni rischi, ma ha un grande potenziale in termini di efficienza, trasparenza, accessibilità e interoperabilità. In quanto tale, può contribuire allo sviluppo di un'infrastruttura finanziaria più affidabile e trasparente.

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**Keywords:** decentralized finance, blockchain technology, industrial revolution, financial services.

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## 1 – Introduction

Within the relationship between banks and firms, technological advancements have created significant and ever-changing developments. In recent years, the financial environment has been characterized by three specific phenomena: the introduction of new and remarkable technologies, the rise of "fintech", and the increase in the number of 4.0 companies. These developments have led to a new development model that requires the creation of financial products that support entrepreneurial initiatives.

To keep up with the times, the traditional banking system has had to offer new services not only to the more sophisticated and complex corporate sector but also to the retail sector. According to the Fintech & Insurtech Observatory at Politecnico di Milano (2021), The most popular fintech services include:

- Mobile payments
- P2P payments
- Family budget services
- Chatbots.

Efforts have been focused on making it easier to use on-demand activities via API services. The use of big data and advanced analytics has enabled banks to maximize the information they have about their customers, allowing them to offer tailored services. The traditional banking system's objective is now centered on redefining the criteria of supply chain finance, digitizing the sales force, upgrading back-end infrastructures, and creating a global transaction banking platform. These prospects have redefined the banking system and pushed it towards new paradigms of competitiveness. This competitiveness is expressed in a constantly changing context driven by innovative fintech offering.

At international level, clear examples of this approach can now be found in the following partnerships:

- HSBC and Tradeshift
- Deutsche Bank and Traxpay
- Banking Circle and SIA

- N26 and TransferWise
- ABN AMRO and Subaio.

However, this approach requires at least two factors:

- the creation of funds to support specific investments in the fintech sector;
- the ability to best meet the user experience.

The traditional banking system is facing a challenging time. Firstly, they risk losing customers who are looking for innovative and high-performance services. Secondly, they are facing competition from third parties in the payment industry who can offer more cost-effective solutions. Therefore, the future of banking is not just about remote banking, but also about providing digital consultation services for potential funding options and collaborating with new fintech companies to meet the specific needs of customers. Traditional banks must also focus on managing their suppliers and cash flow strategically to make a significant impact on their customers. To understand the current scenario, we need to examine why the fintech industry is gaining popularity. Generally, people tend to highlight the vital aspects, such as blockchain, which can help in achieving the goal. (Kamat and Seo, 2019; Durnev *et al.*, 2018; Gervais *et al.*, 2016).

- programmable capacity
- simplification of processes
- transparency.

The *programmable capacity* is due to the coding of the entire business logic. This includes data privacy, compliance, and identity aspects. The *simplification of processes* is due to improved operational efficiency, including real-time regulation of transactions, reporting and auditing.

*Transparency*, on the other hand, ensures that the data processed is intact and is authentically transcribed into the systems. They are complemented by the potential economic benefits defined by improved operating costs, lower infrastructure costs and lower transaction costs. Although they require a continuous and further work of deepening so that they can be properly disseminated at a global level in every financial area, they are aspects already present on the market. They are a technology which has now been developed and which does not seem to determine the ultimate objective of the current evolutionary process.

It is possible that the operations in question are lean and digital. Anticipating trends requires understanding the evolving context, and analyzing and comprehending the motivations and context of the main players is essential. The analysis of decentralized finance, which opposes the centralized financial system promoted by traditional banking players, provides crucial information for understanding the present trend and its significance. This last area, which is essentially an extremization of high-tech financial aspects, aims to exclude any intermediation that traditional credit institutions may represent. Decentralized finance platforms distribute profits while allowing users and the community to have control and governance over them. This is because decentralized networks generate "consensus," meaning no entity has the power to alter or censor the data circulating on them. Consequently, the community involved is the master of the processes and would benefit financially and legally. The statement leads to two fundamental questions: Why and how? The starting point is inherent in the reasons why the adoption of technological innovations is leading to an extreme financial evolution dictated by the marginal role of credit institutions.

This first analytical context allows us to define some key themes:

- evolution of the financing needs of SMEs
- evolution of key players in the Fintech and Decentralized Finance world
- the new role of stakeholders in investment projects (i.e. green ones)

And again, how can traditional and innovative co-exist in the light of current trends and emerging prospects. Thus, key perspectives of this context are:

- the role of international regulation and the influence on first movers in DeFi
- the conversion scenarios of the players involved.

## 2 – Understanding the current needs of firms

### 2.1 – *Adapting to new trends for customers*

In the European Union, small and medium-sized enterprises account for almost all enterprises and about 65% of global turnover. Despite this undeniably important fact, small and medium-sized enterprises are the main victims of an overly complex legal, fiscal and administrative environment which still entails exorbitant costs. These factors ultimately discourage new initiatives, investment in innovation in existing companies, and recruitment of new employees. Stimulating the creation of new small and medium-sized enterprises, based on new technologies, through better access to finance, the marketing of research products, the provision of instruments to facilitate research and innovation, and the promotion of the use of new information technologies, is therefore a significant need in the post-globalisation era (Mastroiacovo, 2019) and in the society of the European Union. information (Paccagnella, 2010).

As already evidenced in numerous studies (Rangone 2020; Rangone 2018; Rangone 2013), banks and other financial institutions have continued to move away from the events of the real economy to focus on financial intermediation based on securities markets. This trend has allowed relationships between providers of capital and users to become increasingly “anonymous” and mistrustful. Small businesses are the ones who suffer most from this depersonalisation of the economy and finance. This is due to the fact that the bank has always been the “successful stakeholder”, which does not forget the relationship with the client and maintains a long-term relationship of trust. It has always been one of the essential features of Europe’s financial market culture and should therefore not give way to any other temptation or fad that characterises the new globalisation of the economy. The main task of the European banking and financial system is to promote the creation and consolidation of an autonomous middle class in the countries of Central and Eastern Europe which are currently undergoing change.

In fact, as we have already pointed out, these same institutions are able to promote the local savings market. In other words, the relationship between small and medium-sized enterprises and the financial and banking sector must be closely linked. The creation of small businesses and their development in terms of efficiency and productivity in the context of continuous and constant competitive conditions imposed by globalisation cannot be separated from a vision of financial management. In addition to an appropriate cost control policy, credit information system and inventory control, as well as product organisation and sponsorship techniques, small and medium-sized enterprises often lack appropriate technical knowledge on the sources

of development finance and working capital. It is therefore necessary to give some thought to this matter.

## ***2.2 – Understanding Firms' needs and investment logic***

The creation or restructuring of a company is certainly a complex process and, in order to obtain benefits, it requires a careful and thoughtful search for the various possibilities to be pursued. The choice of the most appropriate form of investment is important for the success of the investment. The health of a firm thus remains closely linked to its ability to receive financing from credit institutions or to be able to allocate new shares on the market. The interaction between business and credit institutions has a long tradition and in Europe it has certainly acquired a preponderance over the search for capital on the financial market (Tarantola, 2007). Until the creation of DeFi, the banking system was perhaps the only point of contact for small and medium-sized enterprises with the financial world.

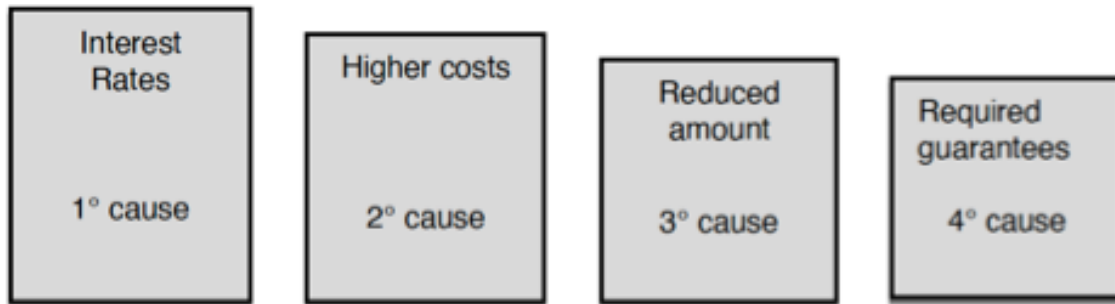
However, the international economic crisis has made this relationship fragile and more difficult, dictated by a substantial decrease in the supply of credit (Wehinger, 2014). In such a context, it is interesting to highlight how the business logic (Rangone, 2018) is progressively related to the evolution of the system of indebtedness useful to carry out actions of corporate restructuring (for companies already started) but also to provide capital for new initiatives. In order to develop this analysis, it is necessary first to identify the main criteria influencing the choice of financing from a business point of view:

- the cost of the loan (expressed in particular in the cost of capital which varies according to the products obtained and in the related administrative costs).
- the terms of the financing (may be short-term or medium-term if the project is highly remunerated or long-term if the project is less profitable but involves more expensive operations).
- the effects of taxation allowing tax deductions to be made on part of the interest accrued on loans.
- the value of the company's assets collateralised for the financing.
- the special conditions imposed by the lenders.
- the ability of the firm to have sufficient liquidity to repay the financing.

However, the relationship between the business world and the financial capital to develop their projects is not unambiguous, so it cannot be seen only in the light of the business perspective. It is therefore important to understand whether, and to what extent, the degree of access to credit is constrained by the performance of companies or, in the current context, financial trends in credit offer by the system have become a dominant variable. The credit offer is linked to a number of factors which – without any claim to be exhaustive – can be here summarised.

Essentially, the solutions are based on the degree of risk involved in the business initiative (Ruozi, 2016) and the company's presence on the stock market. The latter condition has a significant impact on the granting of financing, as it is more likely to attract back-up facilities, merchant banking operations or simply the attention of international investors. However, a more complete analysis cannot disregard macroeconomic variables, which are here understood as determinants and which in some contexts may themselves be conditioned (for example,

inflation may vary according to access to credit, tax policies and the consumer price index). In recent years, due to the economic and financial crisis, some authors have shown that the credit offer has suffered an enormous contraction in Italy, highlighting the impact (Figure 1) of some specific factors (Morettini, 2013).



**Fig. 1 – Factors of the credit crunch in Italy (Source: Authors' elaboration)**

However, in this context, it has been possible to find that, at least in Italy, there are categories of companies for which access to credit is more available and others for which it is more difficult (Rangone, 2018). Looking at the data (Table 1) provided by the Bank of Italy, the answer seems obvious.

**Table 1. Bank interest rates on short-term loans in 2016 in Italy (Source: Bank of Italy, 2017)**

	<b>Small companies</b>	<b>Medium-Large Co.</b>
Nord West	7,33%	3,92%
Nord East	6,39%	3,95%
Center	7,57%	4,58%
South and Isles	8,65%	5,73%

As early as 2016, the survey clearly shows how unfavourable access to credit is for the category of medium-sized companies which, in the case of the takeover under consideration, include partnerships and sole proprietorships, which are already difficult to compete with medium-sized and large-sized companies in global market conditions. This brief review of business needs in the light of the financial possibilities on the market, thus allows us to outline some key aspects in understanding the reasons why (as we shall see in more detail below) the volume of decentralised finance has increased exponentially, and the traditional banking system has found itself in a situation of forced adaptation to the new market conditions. The difficult supply of credit by the traditional banking system is increasingly having the effect of a vortex in which the less flexible or less enterprising companies fall, but also those companies which are anchored in the territory of reference by type of product or service offered.

Just think of a small company operating in highly traditional sectors which hardly resorts to the transfer of its registered office, the opening of foreign branches or the creation of production units abroad. If it invests, it will have to limit itself to the financial offerings provided by the system in which it operates and, as is often the case, it may not be able to access them due to the inability to bear the high rates, the operating costs or the refusal of the banking system, which does not consider it sufficiently performing.

These data and projections are further supported by recent findings of the Observatory Fintech & Insurtech, which demonstrate not only the degree of diffusion of Fintech among Italian companies but also the sector in which the traditional banking and insurance system are committing enormous resources. The Politecnico di Milano (2021) argues that:

The SME sector is also dealing with this Italian digital revolution in finance and insurance, while maintaining a more traditional demand. A significant proportion of SMEs reported using financial products and services aimed at businesses such as Invoice Trading, Medium-Long-Term Loans, Investments, Factoring, Letter of Credit, Cash Flow Forecasting Tools. However, when it comes to accessing these services, there is a balance between physical channels (branch or consultant) and digital channels (Internet Banking from PCs). Only for payment services (such as wire transfers, F24, RI.BA, etc.) the digital channel clearly prevails. Italian micro-enterprises (with fewer than 10 employees) still tend to prefer banks and insurance companies for the demand for financial and insurance services. In general, no non-traditional player in the financial sector (i.e. start-ups, gas/electricity suppliers, insurance companies, supermarkets, telephone operators) is currently trusted by more than 7% of micro-enterprises for financial services and 12% for insurance services (authors' translation).

On the basis of the considerations and the data above presented, the question arises as to whether it is right for the traditional banking system to continue in this race towards digitisation or whether it is right for it to return to its more traditional role of assisting business development. And again, the question arises as to whether small and medium-sized enterprises will necessarily have to look for the many financial products in the decentralized finance market. A system which, as we shall see later on due to its intrinsic characteristics, aims to provide the necessary tools to enterprises (even those not performing) without particular limitations.

### **3 – Decentralized Finance: An overview of Its current state and areas of influence.**

#### **3.1 – Defining the role of decentralized finance**

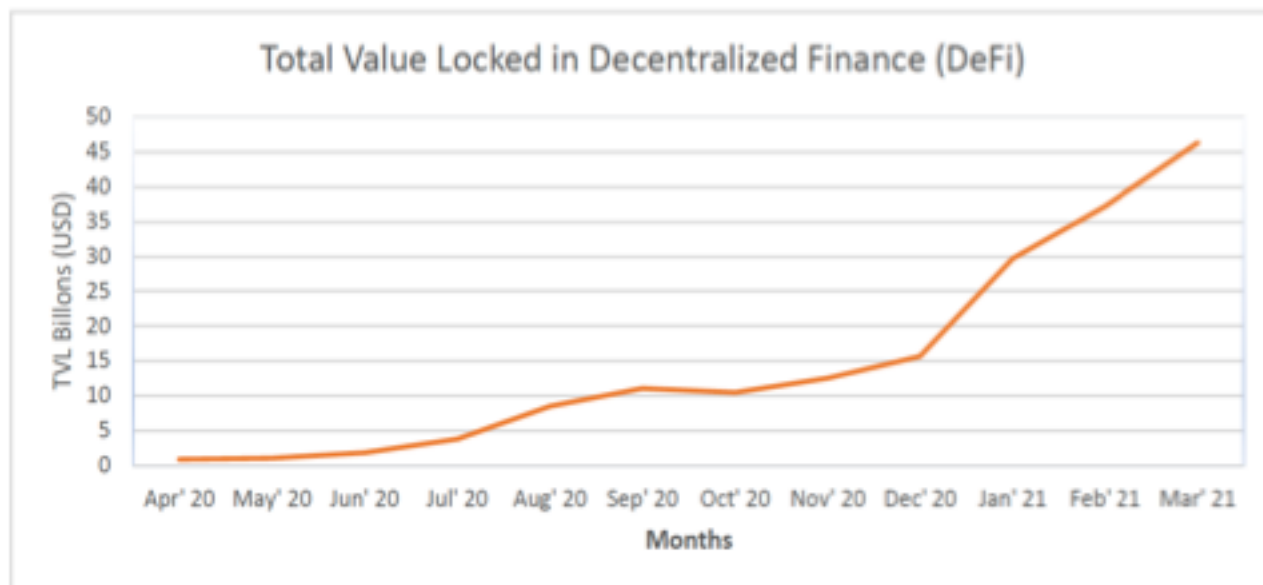
According to the most authoritative and widely used definitions, the term Decentralized Finance (also DeFi) refers to a financial system that provides services based on infrastructures without any hierarchy (Qin *et al.*, 2021; Schär, 2020). By means of these systems, which allow financial transactions to be carried out using cryptocurrencies (Zhou and Shen, 2022), users of all kinds are thus able to access any banking service without resorting to a traditional intermediary.

Through decentralized finance it is possible to exchange digitalized assets, engage in monetary speculation and even get fast loans. With this in mind, payments and transactions are accessible to all, which inevitably leads to a rapid increase in the rate of use of the system in both the private and public sectors. Unlike traditional finance, decentralized finance has broadened financial inclusion while playing a pivotal role in encouraging permissionless innovation and facilitating open access to financial networks.

Digital technology as an essential component of decentralized finance reduces transaction costs, supports peer-to-peer transactions, enlarges transaction scope, and stimulates the process of innovation (Chen *et al.*, 2019). The current state of decentralized finance is still at the initial



stage of its evolution. According to DeFi Pulse (2021), however, the total value of tokens circulated in Defi exceeds \$45 billion as of March 30, 2021, as shown in Figure 2.

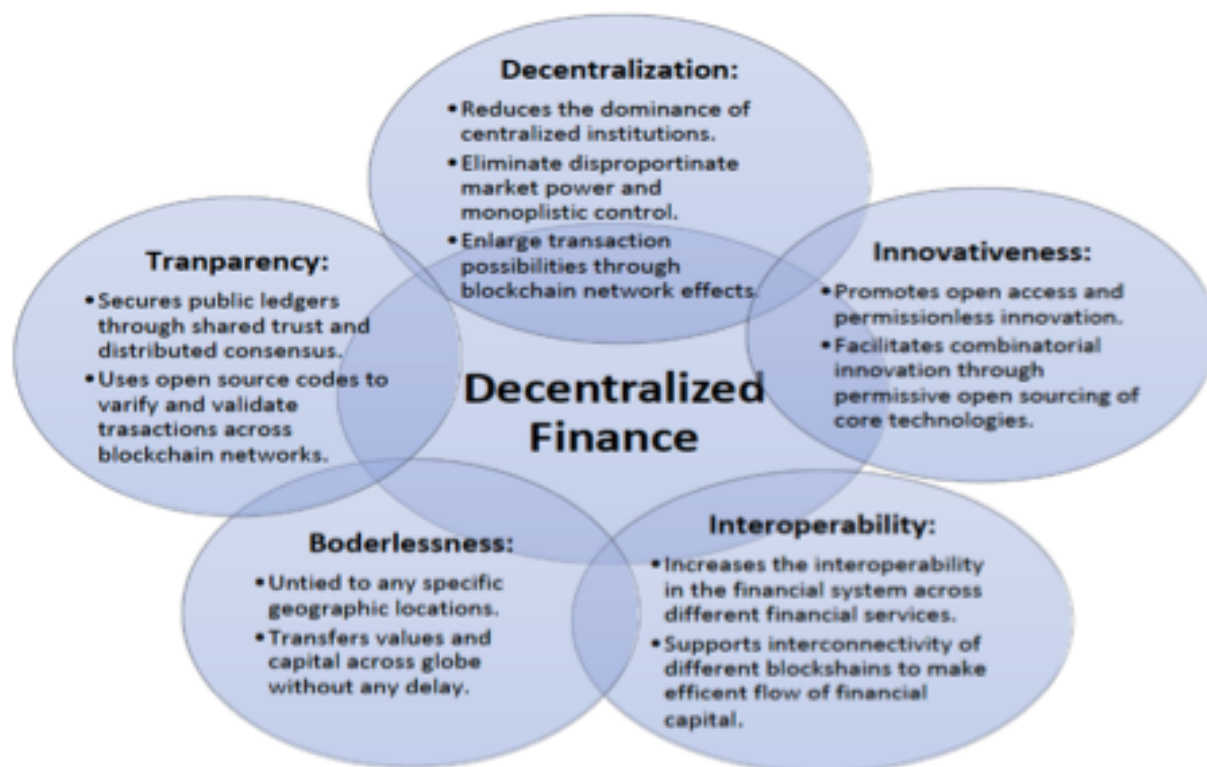


**Fig. 2 – The current state of TVL in Decentralized Finance**

(Source: Authors elaboration from DeFi Pulse (2021))

The total figure may sound substantial because most tokens lack sufficient liquidity to trade in crypto markets (Sharma, 2021). The technological innovation in decentralized finance has become the need of the hour and increased our dependence to handle the complex large volumes of digitalized data on more open, shared networks and multi-platforms (Termeer, 2009). Before the emergence of decentralized finance, financial institutions acted as intermediaries to execute economic transactions. To facilitate the process of transactions, intermediaries established trust among parties to perform transactions (Roth, 2015). However, raised concerns over the monopolistic approach of intermediaries as they often take control over shaping economic transactions as well as exercise their substantial power to maintain self-interests (Srnicek, 2017; Cohen, 2019). Blockchain technology as an important tool of decentralized finance may prove to be the next step in the progression of disintermediation to carry out financial transactions through distributed trust and decentralized networks. Hence, the impact of this disruptive technology on governance mechanisms such as financial reporting, internal and external auditing, shareholders, the board of directors, and regulations calls for studies (Brennan *et al.*, 2019).

This new paradigm is based on distributed trust as opposed to traditional finance that focuses on opportunism because the transactions on a blockchain network are verified through shared consensus and protected by cryptography. Blockchain-based products such as cryptocurrencies compete with traditional financial institutions by proposing an alternative form of corporate governance (Narayanan *et al.*, 2016; Seidel, 2018). According to the Financial Stability Board (2019), the DeFi backed up by blockchain technology not only reduces the role of financial intermediaries but also builds an open financial infrastructure to create new business opportunities through broad financial inclusion and permissionless innovation (Figure 3). However, a system of governance is still needed to govern the design and operations of blockchain within organizational constellations.



**Fig 3 – Features of Decentralized Finance**

(Source: Authors' elaboration, inspired by Chen and Bellavitis, 020)











### ***3.2 – A changing perspective for firms' access to financial capital***

Decentralized finance reshapes the dynamics of the current era of finance by providing a new landscape to establish new platforms for innovators and entrepreneurs to get easy access to financial capital, showcasing the benefits and shortcomings of decentralized business models. Using blockchain technology, the new financial system involves a decentralized form of currencies, payments, financing as well as contracting as an integral part of modern business models. Bitcoin is the most common type of decentralized cryptocurrency that could be issued without any intermediaries but rather use blockchain technology. Unlike fiat currency, the bitcoins are anti-inflationary due to their fixed supply schedule and not tied to a specific country's government and central bank economic policies (Chen and Bellavitis, 2020). Decentralized payments such as payment networks of Libra and Ripple unleashing a new way of making the cross border and inexpensive payments by relying on blockchain technology.

As opposed to centralized finance, they are less costly, more secured, and faster. The rise of decentralized global cryptocurrencies over the last year reached \$1.83 Trillion from just \$179 Million in March of the previous year. In contrast to traditional fundraising, where potential investors have to build strong network ties to win the trust, and often involves several constraints in the financing process.

Decentralized financing has evolved as an innovative financing tool that has given opportunities to various start-ups to raise capital by attracting global investors. At present, 65 start-ups are operating in 18 related markets that have raised \$390 Million of total funding (Ellicott, 2021). The list of small private technology companies that are more inclined towards the decentralized finance ecosystem is shown in Table 2.

**Table 2 – List of small privately-held technological companies in Decentralized Finance**  
(Source: Topionetworks (2021))

	<b>Name of Company</b>	<b>Ownership</b>	<b>Capital raised</b>	<b>No. of Employees</b>
	Celo	Private	65M (USD)	50-100
	Fnality	Private	63.2M(USD)	25-50
	Bitcoin Suisse	Private	48.9M (USD)	50-100
	Eco	Private	35M (USD)	10-25
	Compound	Private	33.2M (USD)	5-10
	Metaco	Private	17M (USD)	10-25
	Monolith	Private	16.7M (USD)	10-25
	Argent	Private	16M (USD)	10-25
	MODE	Private	10.4M (USD)	10-25
	Uniswap	Private	11M (USD)	5 or less

Blockchain technology is an integrated network that changes the landscape of decentralized financing (Chen, 2018). The most prominent forms of decentralized financing are initial coin offerings (ICO) and initial exchange offerings (IEO). The ICO uses public blockchain to sell the project-specific token to investors to raise capital. Whereas (IEO) relies on cryptocurrency exchanges to create a connection between high-quality projects and potential investors (Martino *et al.*, 2019; Chen and Bellavitis, 2020).

For centuries, the parties involved in transactions relied on financial institutions for financial contracting at low transaction cost through establishing trust (Murray *et al.*, 2019). Over the last few years, the blockchain has substituted the role of centralized institutions with smart contracts that leads to the new paradigm of peer-to-peer financial contracting. Smart contracts not only solve the issues of adverse selections and contingencies associated with contracting but also

reduce transaction costs, delays, and frictions in their programming process due to their automaticity and transparency (Cong and He, 2019).

### 3.3 – *Changing approaches in the landscape of Corporate Governance*

Blockchain technology emerges as one of the most prominent and core technologies in industry revolution 4.0 (Kim *et al.*, 2020). It has the potential to completely transform the way the financial system works: it eliminates traditional processes and offers opportunities to flourish existing business units and to expand new ones (Morkunas *et al.*, 2019). While the reduction in cost and improvement in the overall efficiency of decentralized financial systems, practitioners observe that blockchain will create new forms of “economic organization and governance” (Davidson *et al.*, 2016). On the other hand, corporate governance includes a set of monitoring principles aiming to ensure accountability and transparency (Gillan, 2016). The decentralized form of blockchain tied with greater speed and transparency have an impact on those contributing to corporate governance scenarios. The unpredictable and rapidly evolving nature of technological changes is more likely to collide with traditional approaches to governance which are hierarchical and less self-regulated (Gans, 2016). The implications of blockchain are then an essential component of decentralized finance for corporate governance mainly focusing on financial reporting transparency, corporate ownership, shareholder’s voting and stock trading transparency as well as regulatory mechanisms as it emerges from the recent literature (Yermack, 2017; Kimani *et al.*, 2020).

Major stock exchanges across the globe are now looking for the possibility of using blockchain technology to keep a record of stocks issued by companies and to monitor subsequent trading activities related to such stocks (Yarmack, 2017). The unparalleled transparency feature of blockchain technology could help investors to ascertain the real-time ownership status of the debt and equity investors and combat ill practices on the part of exchanges, registered companies, and regulators (Singh *et al.*, 2019). It has not only replaced the traditional corporate practices but also provides a great degree of transparency, accuracy, and efficacy in stock ownership and corporate voting as well as reduce corporate misbehavior and wrongdoings noticeably (Nasdaq, 2017).

The codes in their respective digital wallets within the permissioned blockchain technology such as distributed ledger technology (DLT) could help trace the shareholder’s identity. It also benefits investors in trading of shares as the blockchain minimizes the processing time of share-based transactions due to its less reliance on clearinghouses as opposed to the traditional financial system, consequently, reduces the settlement time for the delivery of the shares and eliminates paper shares to a greater extent. While conceptualizing the wider implications of blockchain technology for different types of assets, Yermack (2017) argued that “innovators continuously now considering the suitability of blockchain for recording the ownership of various types of assets from stocks and bonds to automobile titles, real state and works of art”. A decentralized financial system could solve the issue of lack of shareholder engagement that has been highlighted in the corporate governance codes, the shareholder engagement system could be improved through blockchain technology as it affects the dynamics of power among managers, the board of directors and shareholders, therefore minimizes the agency problems. The decentralized blockchain organizations interrupt traditional principle and agent relationships through blockchain technology at the core of corporate governance. The developers write the rules such as software codes in a decentralized way instead of board

members, CEO's or senior managers. The stakeholders exercise power and govern the blockchain technology at a varying level in different arrangements (Narayanan *et al.*, 2016).

Moreover, the chances to conduct insider trading and stock backdating are nearly impossible as the users in some types of permissioned or permissionless blockchain technologies won't be allowed to hide or change the original entries of the stock so decentralized finance has also provided a solution to the issues relating to stock ownership of employees. The data integrity, speed and cost of financial innovations certainly improve "timely record-keeping" of stocks in real-time. Every participant in the shared or distributed network can invigilate the trading patterns of all major stakeholders. Blockchain technology impacts managerial stock options, for instance, reduces their ability to gain personal profits by using internal information. Thus, they cannot enjoy hefty incentives through stock-based compensation due to the greater vigilance of their transactions over blockchain (Yarmack, 2017).

Another feature of distributed nature of the decentralized finance ecosystem is the digital vote or e-vote system that makes the manipulation of shareholder voting difficult in the annual general meeting while appointing board members that was easily done in the past under the traditional finance system. Now it will be quite easier for shareholders to cast votes on a blockchain network. This leads to the reduction of election and voting cost and in turn achieves better voting turnout with less possibility of rigging (Lafarre and Van der Elst, 2018). The strategies used in corporate voting such as "No Vote" that were intended to misuse voting rights are not now easy to execute furtively in a decentralized finance ecosystem (Yermack, 2016; Sisli-Ciamara, 2012). Furthermore, the shareholders are motivated to participate actively in corporate governance and demand votes on highly sensitive issues with a greater degree of enhanced transparency of the blockchain nature of decentralized finance (Haque, 2018).

### **3.4 – *The implications of blockchain technology on accounting systems***

Previously, it has been mentioned that decentralized finance is able to change the corporate reporting and disclosure landscape since the inception of blockchain technology. There are several implications of blockchain technology for accounting systems. Piazza (2017) and Yarmack (2017) predict its unprecedented role to keep records of financial data, especially on permissionless public blockchains. The stakeholders requiring financial information do not necessarily have to rely on the verification of the auditors. Instead, they could make their accounting judgment, for instance, on non-cash adjustments such as inventory revaluation and depreciation, with their trust in the available financial data on corporate blockchains (Deloitte, 2016). It improves the trustworthiness of financial reports as it enables real-time accounting due to the daily updating of accounting entries and fewer chances of alteration in the blockchain ledger (Byström, 2019). The books of accounts and all kinds of financial information are now easily accessible, the companies could submit financial reports and returns to various regulatory bodies and institutions to fulfill the formalities in real-time. Corporate information (Key Performance Indicators, financial reports, strategic management reports) can be disclosed flexibly and these disclosure blocks are generated on a platform for auditor's verification and countersign to file them in the national storage system (NSM).

The disclosure of financial information in a decentralized blockchain system will be more likely to be easy, compatible, timely and cost-effective from the preparer's perspective. Similarly, it will be more engaging, useable, credible and contextual from the user's point of view (Financial Reporting Council, 2018). Notwithstanding, there are some limitations to the

use of blockchain-based of decentralized finance. Commentators questioned the immutability of blockchain and its technological relevance. Davidson *et al.* (2016) and Rückeshäuser (2017) argued that blockchain may not prevent fraud and the senior manager will still be able to commit fraud. Hence, the integrity of data using blockchain could be challenged. For efficient blockchain performance, its size should be large to speed up the transaction process which would ultimately lead to higher transaction costs.

Decentralized finance will also transform the accounting profession because of blockchain technology. Lazanis (2015) argued that the role of auditors will be greatly condensed or even eliminated. Since the financial records on blockchain could not be manipulated or tempered and if corporates maintain all their record on a shared network, the need of external auditor’s judgments or opinions on the financial statement are no longer needed (Byström, 2019). On the other hand, the blockchain transforms internal audits into a continuous process because internal auditors could continuously perform internal audits with account analysis and audit trails using blockchain at a push-button (Vasarhelyi *et al.*, 2015). However, the blockchain-based internal audit brings some challenges since internal auditors need to have access to information in new formats to maximize the real-time value of continuous information (Rooney *et al.*, 2017).

## 4 – Scenarios and Perspectives

### 4.1 – Corporate sustainability and stakeholder relationships

The evolution of new paradigms aimed at meeting the financial and business needs of enterprises 4.0 requires analyses also inherent to the new figures of stakeholders. If, for example, one considers the green environment now more than ever the focus of international attention (Rangone and Ali, 2021), a business development plan may require particular investments and resources that a micro-small company can hardly achieve (at least in the short term). As we have explained in the course of this work, certain fintech technologies (the ones that define decentralized scenarios) are able to support initiatives that protect stakeholders, unlike traditional financial players that mainly support initiatives with high economic returns (Fig. 4).

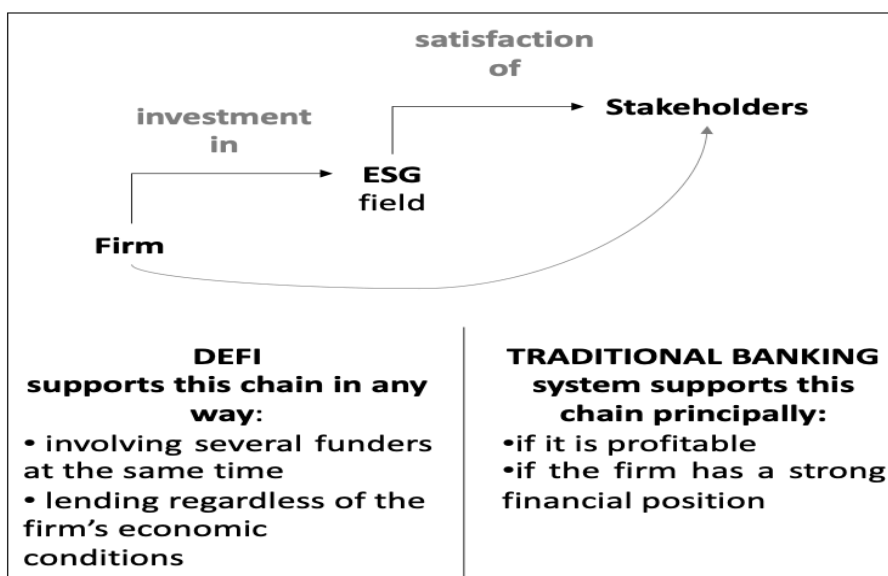
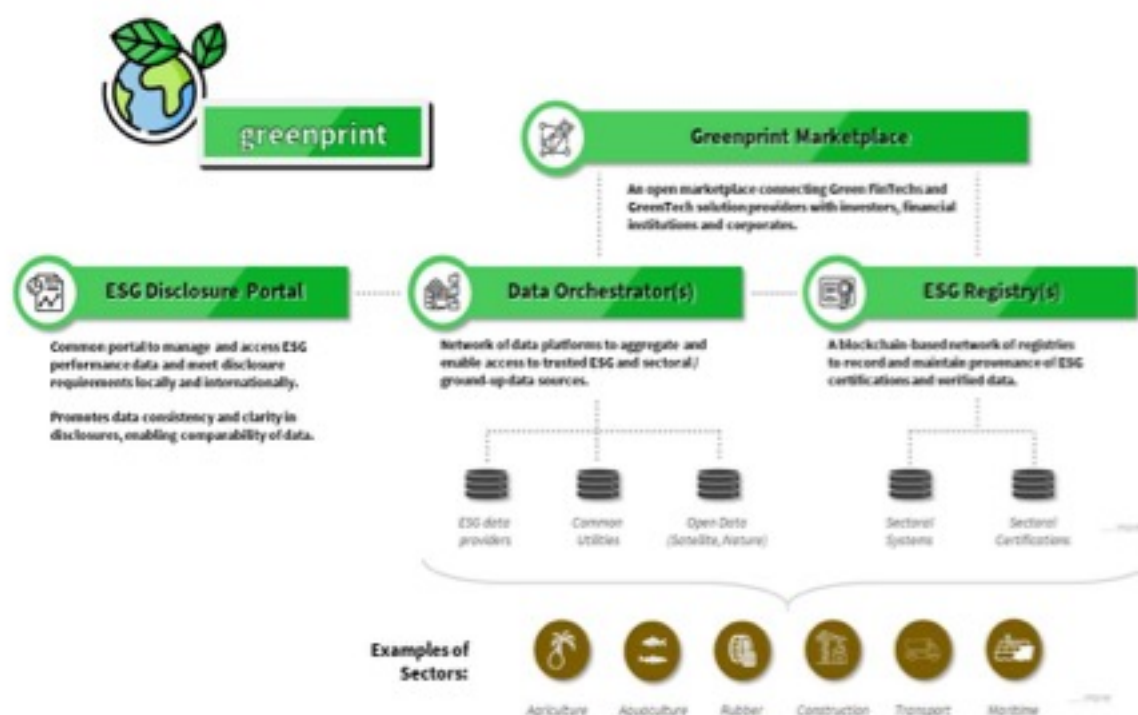


Fig. 4 – Different perspectives of financial support in the firm-stakeholder relation  
 (Source: Authors’ elaboration)

On this regard, interaction with the public world is an equally important aspect which cannot be overlooked. There are still few initiatives that involve public players and the fintech world in a sustainable way. An outstanding example of this is the FinTech initiative launched by the Monetary Authority of Singapore, which began in 2015 and which have made Singapore one of the world's leading FinTech hubs. The project "Greenprint", in fact, manages to combine the power of finance with the opportunities and prospects provided by technology. The Monetary Authority of Singapore will collaborate and act as coordinator to develop digital utilities to facilitate the efficient flow of reliable Environmental, Social, and Governance (ESG) data. Above all, the project (Figure 5) aims to support financial institutions and businesses in mobilising capital for sustainable projects, monitoring commitments and measuring impact.



**Fig. 5 – Project Greenprint Platforms** (Source: Monetary Authority of Singapore, 2022)

The Greenprint Marketplace will facilitate the growth of a vibrant green fintech ecosystem by connecting fintech and green tech suppliers to investors, financial institutions and companies.

The digital platform will provide accurate lists of solution providers, solution seekers and investors to facilitate discovery, acceleration of partnerships and channelling investments towards green and sustainable solutions and initiatives. The launch is planned for 2023 (Monetary Authority of Singapore, 2022). Examples of such public-private interaction are, however, very limited in the world and risk to involve large corporate players rather than small and medium-sized enterprises.

This last protocol is no longer acceptable. Small and medium-sized enterprises are also called upon to make their contribution in a sustainable manner (OECD, 2017). This contribution, however, is not always very profitable and would therefore not be possible at a time when traditional credit providers do not support the "risky" initiatives of SMEs. Hence the need to raise funds directly on the market, join forces with multiple partners and financiers to

collaborate on projects that are not exclusively dependent on economic and financial factors but can fulfill the highest-sounding task of corporate sustainability.

In the decentralised market, stakeholders can become an active part of initiatives contributing to the successful implementation of projects. Keeping as an example in the environmental field, faced with this emerging reality, in 2020 several scholars proposed a blockchain-enabled green bond issuance architecture. Malamas *et al.* (2020) have proposed a system which also acts as a transparent but fully controllable decentralised authority where funds for environmentally friendly projects can be traced. This is because in a “traditional” context, for example, bond issuance is a highly technical and complicated process. It sometimes involves stakeholders who do not trust each other and sometimes have conflicting objectives. Therefore, they have worked to propose an adaptable and efficient system that reduces brokerage costs and provides compliance, scalability, confidentiality and security (Malamas *et al.*, 2020).

This is not the only study on green bonds. Schletz *et al.* (2020), for example, have applied an inductive approach based on the qualitative evidence of expert feedback to assess the potential of blockchain-based security tokens in the face of multiple market failures that have constrained green investment vehicles. Evidence shows how Tokenised securities, although evolving, can contribute to a genuine democratisation of green finance. There are, however, sources that provided considerations about constraints and risks as well.

Among these, Schletz *et al.* (2020) highlight software risk, regulatory uncertainty and investment infrastructures which are still immature at present. While infrastructure development and software risk depend on strictly focused efforts in the technology field, the regulatory aspect may initially require the development of pilot use cases and the creation of regulatory sandboxes (Bank of Italy, 2022); however, these should not be considered sufficient, as we will see later – the regulatory environment affects many aspects.

#### **4.2 – The development and progress of financial systems.**

In the light of what has been analysed from many points of view, the outlook now seems clear. The traditional banking system will no longer be limited to managing innovative processes to deliver technologically advanced products. Business needs are becoming more complex every day, especially for small businesses. This is the reason why so many fintech companies have sprung up and, above all, the system of decentralised finance has spread.

Traditional banks invest heavily in new technologies and powerful security systems that can guarantee stability, transparency and fairness (Caccavale and Righi, 2018; Mottura, 2009). However, we must not forget that the most important need of companies is credit. This is the premise of the bank-business relationship and in recent years, due to the imposition of risk conditions and the economic and financial crisis, SMEs have been increasingly neglected by the banking system. This has certainly fostered the conditions for a transition from traditional to innovative. Some authors (Qin *et al.*, 2021) expect CeFi and DeFi to co-exist, to complement, to strengthen and to learn from each other’s experiences, mistakes and innovations. This prospect could also be realised but, in our view, not without a radical change in the order now taking place. Until the birth of decentralized finance, there was talk of bank-based and market-based systems (Rangone, 2017; Boadi *et al.*, 2019). Today, the scenario is undergoing profound change, or rather, the order of these two financial systems is evolving (Table 3).



**Table 3 – Perspective in the evolution of financial systems** (Source: Authors’ elaboration)

Subject	Objectives	Needs	System	Solutions
SME	New business models	SMART TECH	Market-based	FINTECH
	investments	CREDIT		DEFI
Large CO.	strategic planning	CONSULTING	Bank-based	TRADITIONAL BANKS/ INSTITUTIONAL INVESTORS

If, according to the literature, market-based systems have mainly characterized “Anglophone” countries, we propose the hypothesis that with the advent of decentralized finance this system may change in relation to the size and new needs of companies. The fintech financial market will be better able to meet the needs of small and medium-sized enterprises in terms of technological innovation, credit and new partners as they are leaner because they are less constrained by economic, legal and institutional constraints. On the contrary, the provision of advice linked to strategic business development plans will increasingly become the prerogative of large traditional banking players and institutional investors, who will see medium-large companies as their main clients. This work, therefore, presents a new geographical scenario in which market-based and bank-based systems are more diluted within their territorial boundaries but better differentiated according to the perspective of the services offered.

**4.3 – The need for complete mechanisms of regulation**

In this context, it is not possible to think that the evolutionary process will take place without potential problems. Some thought must therefore be given to the way in which the decentralised system will develop. The massive development seen in recent years has been mainly driven by technological solutions on the market today, by the pressing needs of micro and small-medium-sized enterprises, but also by a lack of regulation. However, a lack of regulation is unacceptable and will require action to ensure an appropriate balance of the balances at stake. Unlike traditional banks bound by risk standards and regulatory thresholds, most of the players in DeFi and some Fintechs can now operate almost completely independently by meeting market demands, particularly those of start-ups, micro-enterprises and SMEs.

According to KPMG (2019) studies, the absence of precise regulation defines the emergence of potential new risks such as:

- risks to consumers and investors: mis-selling of products and services, privacy, data protection, information security;
- risks to financial intermediaries: sustainability of the business model, governance, technological risk, operational resilience, data management, use of artificial intelligence, anti-money laundering issues;
- risks to financial stability: risk of concentration, uncontrolled spread of alternative financial intermediation channels, use of crypto assets, vulnerability.

With the emergence and spread of an increasingly decentralised financial system, a level playing field will be required to achieve equal regulatory treatment. To this end, the European Fintech Action Plan (European Commission, 2018) in this case aims to:

- reduce the risks of recycling
- reduce the number of infringements
- create greater transparency towards customers and users.

Without precise development models and a clear regulatory framework, fintech companies may find themselves unable to cope with the exponential growth in funding requests. However, this is only one of many contexts which should be regulated. The key challenge is not just in the adoption of blockchain technology but the way it is going to be regulated since the technology serves different purposes in tandem with several regulatory constraints. For instance, each cryptocurrency has its own set of self-regulation. The recent literature argued that blockchain technology is likely to facilitate and disrupt the traditional corporate governance mechanisms. Governments and firms around the world require a regulatory framework before the adaption of blockchain technologies since the unregulated technological innovations might pose hazards in the business operations (Leong *et al.*, 2017). Some countries where the political and regulatory situation are conducive such as the UK, Australia, Sweden, and especially Singapore that is leading in developing a user-friendly regulatory framework to facilitate the implementation of digital decentralized technologies (Lee and Shin, 2018). Setting a regulatory agenda promotes the proliferation of blockchain to settle payment proceeds and to raise capital without the presence of traditional financial systems (Zhu and Zhou, 2016). Blockchain technologies in decentralized finance are expected to revolutionize the financial industry to deter money laundering or fraudulent financial reporting tactics which have been remained a part of a debate in the literature of blockchain adoption (Kimani *et al.*, 2020).

The regulators play a decisive role in setting standards and the agenda of governance. The disruptive innovations of blockchain will need to expand into more agile and real-time policymaking. In setting boundaries of governance, regulators could have access to blockchain to review the real-time transaction. A smooth transition towards disruptive innovations requires best practices, skills and new rules of law (CPA Canada, 2016). Tormen (2019) emphasized the importance of blockchain to ensure that strong governance is in place to define the roles and responsibilities of every participant in the network to design blockchain infrastructure in a decentralized ecosystem. Yarmack (2017) also suggests the establishment of new governance models to govern blockchain, a process of the model in which participants agree to protocols for the underlying software encryptions to be changed. A governance model should address six regulatory issues presented by Cermeño (2016) before the adoption of blockchain technology; “these are legal nature of blockchain and distributed ledger, recognition of immutability, source of tamper-proof truth, the rights to be forgotten, the legal validity of the

documents that are stored in the blockchain and validity of financial instruments using smart contracts”.

A trust could be built through collaborative governance to make sure that all stakeholders act according to agreed rules. Regulations concern laws to control behaviors, while governance engages collaboration, stewardship, and incentives to act on mutual interests. The governments need to regulate blockchain technologies as a collaborative peer with other societal constituents instead of relying only on law (Tapscott and Tapscott, 2016). The lack of collaborative governance is one of the main impediments to realize the real-time societal benefits of blockchain technology. However, it can be achieved with the formulation of policies, mechanisms, procedures, and enforcement (Janssen *et al.*, 2020).

## 5 – Conclusions

This work aims to provide an understanding of the perspectives and needs of players operating in the new international financial scenario dictated by DeFi. We can summarize some fundamental aspects at the end of this proposal. Banks, born during the Renaissance period, have played a crucial role in transnational capitalist development by financing productive enterprises and governments. They have fostered socio-economic change, transforming feudal societies into mercantile ones and eventually into industrial ones in the following centuries.

The financialization of the economy has transformed the traditional banking system into a significant player in global development, rather than a successful stakeholder of local businesses. Although this trend has enabled banks to meet internal performance and external regulatory compliance criteria, it has also pushed them towards a speculative entrepreneurial structure that favours short-term profitable investments. This competitiveness policy has caused the banking system to neglect the economic and social development of the local territory, leading to global bubbles that have been observed over time and felt more recently with the 2007 crisis.

The banking system's change in strategic action is believed to have had a massive impact on the economic and social crisis, leading to political and institutional repercussions that we still experience today. These factors have greatly influenced the development and application of new technological solutions in the financial world, such as DeFi. DeFi provides a range of financial services, including debt capital, equity, insurance, currency exchange, trading, assets, and business partners, without the need for intermediaries to arrange transactions or impose heavy constraints. During a time when companies struggle with credit barriers, international economic instability, and difficult regulatory compliance, the availability of such heterogeneous solutions offered by decentralized finance is an interesting alternative. However, it's not the only aspect to consider. More importantly, the prospects that this trend presents should be analyzed. We've looked at the effort that the traditional banking system is putting into technological reconfiguration projects. While these initiatives may lead to more updated services, they won't help meet the millennium challenge.

The battle between DeFi and CeFi systems will witness an exchange of witnesses. However, the victory will belong to those who can best serve the customers. Fintech initiatives offer solutions that can simplify the operations of companies and private citizens for limited operations, but only for the more mature generations. Those who were born before the spread of Blockchain are the ones who admire it the most. On the other hand, the generations born after the spread of Blockchain are naturally inclined to search for solutions online for their problems.

This inclination defines a limited relationship with fintech solutions and an increasingly marginal relationship with the traditional banking system. DeFi, however, is what establishes a deep core relationship with these generations. To limit this process, two actions are necessary. Firstly, a return to the original role of the banking system alongside the local business. This would be possible by successful stakeholders who can support, advise, and facilitate SMEs even in critical development situations. Secondly, a deep and careful regulation of the financial market dictated by DeFi is needed. Only compliance constraints can limit the operation of a system designed to be autonomous and independent, but it won't be easy given the interests at stake.

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