

DECENTRALIZED FINANCE (DEFI): OPPORTUNITIES AND RISKS IN THE FUTURE OF FINANCIAL ECOSYSTEMS

KEUANGAN TERDESENTRALISASI (DEFI): PELUANG DAN RISIKO DI MASA DEPAN EKOSISTEM KEUANGAN

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ABSTRACT

Decentralized Finance (DeFi) has emerged as a significant innovation in the global financial ecosystem, offering an alternative for individuals who do not have access to traditional banking services. However, challenges such as regulatory uncertainty, security risks, and volatility of crypto assets hinder the widespread adoption of DeFi. This research aims to analyze the opportunities and challenges facing DeFi in the global financial system and evaluate its impact on financial stability and regulation. Using a Systematic Literature Review (SLR) approach, this research collects and analyzes literature from leading academic databases, including Scopus and Web of Science, with a focus on relevant studies between 2019 and 2024. Thematic and comparative analysis is applied to identify key themes and compare DeFi with traditional financial systems. The findings show that DeFi offers greater cost efficiency and accessibility, but also faces significant risks regarding volatility and security. Regulatory uncertainty in various countries is a barrier to wider adoption. This research provides important insights for regulators and industry players into how DeFi can serve as a complement to traditional financial systems, while emphasizing the need for a clear regulatory framework to support innovation and protect users.

Keywords: Decentralized Finance, DeFi, Asset Volatility, Regulation, Financial Inclusion.

ABSTRAK

Keuangan Terdesentralisasi (DeFi) telah muncul sebagai inovasi signifikan dalam ekosistem keuangan global, menawarkan alternatif bagi individu yang tidak memiliki akses ke layanan perbankan tradisional. Namun, tantangan seperti ketidakpastian regulasi, risiko keamanan, dan volatilitas aset kripto menghambat adopsi luas DeFi. Penelitian ini bertujuan untuk menganalisis peluang dan tantangan yang dihadapi DeFi dalam sistem keuangan global serta mengevaluasi dampaknya terhadap stabilitas keuangan dan regulasi. Menggunakan pendekatan Systematic Literature Review (SLR), penelitian ini mengumpulkan dan menganalisis literatur dari database akademik terkemuka, termasuk Scopus dan Web of Science, dengan fokus pada studi yang relevan antara tahun 2019 hingga 2024. Analisis tematik dan komparatif diterapkan untuk mengidentifikasi tema utama dan membandingkan DeFi dengan sistem keuangan tradisional. Temuan menunjukkan bahwa DeFi menawarkan efisiensi biaya dan aksesibilitas yang lebih tinggi, namun juga menghadapi risiko signifikan terkait volatilitas dan keamanan. Ketidakpastian regulasi di berbagai negara menjadi penghalang bagi adopsi yang lebih luas. Penelitian ini memberikan wawasan penting bagi regulator dan pelaku industri tentang bagaimana DeFi dapat berfungsi sebagai pelengkap sistem keuangan tradisional, sambil menekankan perlunya kerangka regulasi yang jelas untuk mendukung inovasi dan melindungi pengguna.

Kata Kunci: Keuangan Terdesentralisasi, DeFi, Volatilitas Aset, Regulasi, Inklusi Keuangan.

1. INTRODUCTION

Decentralized Finance (DeFi) represents a fundamental shift in the financial landscape by leveraging blockchain technology to provide financial services directly between users, without the need for traditional intermediaries such as banks. This change is driven by technology *smart contracts* which allow transactions through peer-to-peer security and protocol automation, thereby increasing transparency and efficiency in financial operations

(Bakare et al., 2024; Schär, 2021). Its decentralized nature encourages the creation of a more inclusive financial ecosystem, which can potentially increase access to financial services globally, especially for individuals who have been marginalized from the conventional banking system (Muhammad et al., 2024).

The exponential growth of DeFi in recent years is reflected in the significant increase in Total Value Locked (TVL) in various DeFi protocols, reflecting increasingly widespread user adoption as well as increasing investor interest (Adisa et al., 2024; Wang et al., 2021). This trend shows the potential of DeFi in disrupting the traditional banking system by eliminating dependence on centralized authorities (Werner et al., 2021). Additionally, DeFi integrates various advantages of modern technology, such as reduced transaction costs as well as the ability to transact in a trustless environment (trustless), where users do not need to rely on the reputation of intermediaries to guarantee the security of their transactions (Bakare et al., 2024; Ahmed, 2024). The emergence of various DeFi applications is considered an evolution of traditional financial systems, offering innovative financial instruments that can meet the needs of diverse users (Choi & Kim, 2024; Metelski & Sobieraj, 2022).

However, although DeFi shows promising prospects, the ecosystem still faces various challenges that could hinder its widespread adoption. Regulatory uncertainty remains a major concern, as the government and financial authorities are still trying to determine the classification and supervisory mechanisms for these decentralized financial activities (Smith, 2021; Wronka, 2021). The absence of a central authority in DeFi poses challenges in meeting existing financial regulations, such as requirements Anti-Money Laundering (AML) and Know Your Customer (KYC) (Zetzsche et al., 2020; Gudgeon et al., 2020). Additionally, security risks posed by smart contract vulnerabilities have caused significant financial losses, raising questions about the reliability of DeFi systems as well as the resilience of the underlying technology (Gogol et al., 2023; Kaur et al., 2023).

The high volatility of digital assets used in various DeFi platforms also raises concerns about financial stability as well as investor protection (Σακάς et al., 2023). Extreme price fluctuations, often exacerbated by speculative trading and market manipulation, highlight the need for better risk management frameworks tailored to DeFi's unique challenges (Kaur et al., 2023). Nonetheless, research and innovative solutions continue to develop, offering approaches that aim to reduce risks while improving the structural integrity of DeFi systems (Weingärtner et al., 2023; Akindotei et al., 2024). Overcoming these challenges will be crucial in maximizing DeFi's potential and effectively integrating it into the global financial system. Thus, DeFi can become a sustainable financial alternative to traditional financial services, while ensuring adequate protection for market participants from the various risks inherent in this system (Muhammad et al., 2024; Choi & Kim, 2024).

This research is important considering the transformational potential of DeFi in the global financial system. Decentralized finance not only offers an alternative for individuals who do not have access to traditional banking services, but also has the potential to reduce transaction costs and increase the efficiency of financial markets. Despite this, several factors remain key obstacles to the widespread adoption of DeFi, including regulatory uncertainty, with DeFi regulation still in its infancy in various jurisdictions, creating legal risks for investors and users. In addition, security and technology risks are also a concern, given the vulnerabilities in smart contracts and the potential for cyber attacks that could cause major losses to users. Market volatility is also a challenge, because crypto assets used in the DeFi ecosystem have high price fluctuations, which ultimately increases systemic risk.

On the other hand, although investors and academics are showing high interest in DeFi, there is still a gap in the literature discussing the economic and regulatory implications of this phenomenon. Therefore, this research aims to fill this gap by providing a systematic analysis of the impact of DeFi on the traditional financial system. Current literature focuses more on aspects of blockchain technology and smart contract mechanisms in DeFi, while

studies exploring the impact of macroeconomics, financial stability and regulation are still very limited. Some of the key gaps in previous research include the lack of comprehensive studies on how DeFi can replace or complement traditional financial systems, as well as the lack of research evaluating DeFi's potential in increasing financial inclusion in developing countries. Additionally, there are limited systematic academic studies comparing the efficiency of DeFi financial markets with traditional finance.

Thus, this research aims to provide new insights into the potential, challenges and future of DeFi in the global financial ecosystem. This research has two main contributions, namely in the academic and practical fields. From an academic perspective, this research provides a systematic review of the role of DeFi in replacing or complementing traditional financial systems and adopts a Systematic Literature Review (SLR) approach to analyze current literature objectively and evidence-based. Meanwhile, from a practical side, this research provides recommendations for regulators in formulating policies that can support DeFi innovation without sacrificing financial stability. Apart from that, this research also provides insights for investors and industry players regarding the opportunities and risks that exist in the DeFi ecosystem.

To understand the dynamics of DeFi in the global financial system, this research adopts several main theoretical frameworks. First, Traditional vs. Modern Financial Theory Decentralized Finance used to compare conventional financial systems based on intermediaries with DeFi which relies on smart contracts. Second, Modern Portfolio Theory (MPT) is used to analyze how DeFi assets can be incorporated into investment portfolios to increase risk and return efficiency. Furthermore, Efficient Market Hypothesis (EMH) used to examine whether DeFi markets are more efficient than traditional financial markets in reflecting price information. Finally, Institutional Theory is used to explore how traditional financial institutions are adapting to the innovations brought by DeFi as well as how regulation can play a role in governing decentralized financial markets.

This research departs from the main question: to what extent does Decentralized Finance (DeFi) have the potential to replace or complement traditional financial systems? To answer these questions, this research aims to analyze the opportunities and challenges facing DeFi in the global financial system, evaluate its impact on financial stability, regulation, and accessibility of financial services, and provide evidence-based recommendations for regulators, investors, and industry players regarding the future of DeFi. With a systematic and evidence-based research approach, this study is expected to make a significant contribution to academic and policy understanding regarding decentralized finance and its implications for the global financial system.

2. METHODS

2.1. Research Design

This research uses an approach Systematic Literature Review (SLR) which refers to the method Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA). SLR was chosen because this method allows identification, evaluation and synthesis of research results that have been carried out previously in a systematic and structured manner. By using PRISMA, this research will follow a transparent process in selecting and filtering relevant literature to answer the research questions comprehensively. The PRISMA method consists of four main stages: identification, filtering, eligibility, And inclusion. This stage will ensure that only relevant and high-quality studies are used in the analysis, so that the research results are reliable and have a significant academic contribution.

2.2. Data Collection Process

To obtain comprehensive data, a literature search will be carried out on several leading academic database, that is:

- Scopus (for high quality academic publications and highly reputable journals)
- Web of Science (for cross-disciplinary research covering finance and blockchain technology)
- IEEE Xplore (for articles focusing on the technological aspects of DeFi)

Search Keywords

The search strategy will use a combination of keywords designed to capture various related aspects of Decentralized Finance (DeFi). Frog Keys used include:

- "Decentralized Finance"
- "DeFi risks and opportunities"
- "Blockchain-based financial systems"
- "DeFi vs Traditional Finance"

To ensure broad and accurate coverage, searches will also be used operator Boolean like AND, OR, dan NOT and techniques truncation and wildcard to include variations of related terms.

Inclusion and Exclusion Criteria

So that the analyzed literature remains relevant to the research objectives, the following criteria are applied:

- **Inclusion criteria:**
 - Academic studies have been peer-reviewed in a span of time 2019–2024.
 - Focus on DeFi's impact on the global financial system, including regulatory aspects, risks and opportunities.
 - Article discussing interaction between DeFi and traditional financial systems.
- **Exclusion criteria:**
 - Non-academic articles such as industry reports or opinion pieces without empirical support.
 - Studies that focus only on technical aspects of blockchain without relevance to the financial sector.
 - Publications in languages other than English or that do not have a verifiable translation.

2.3. Analysis Approach

Data collected from the literature search results will be analyzed using the following approaches:

1. Thematic Analysis

This approach is used to identify the main theme in research related to DeFi opportunities and challenges. Selected articles will be coded based on frequently occurring topics, such as financial stability, regulation, security risks and financial inclusion.

2. Comparative Analysis

This analysis will be used for comparing DeFi systems with traditional financial systems. The main focus in this comparison is efficiency, accessibility, risk, and the role of regulators in both systems. With this method, research can illustrate whether DeFi has a competitive advantage or is simply a complement to existing financial systems.

2.4. Justification of Method

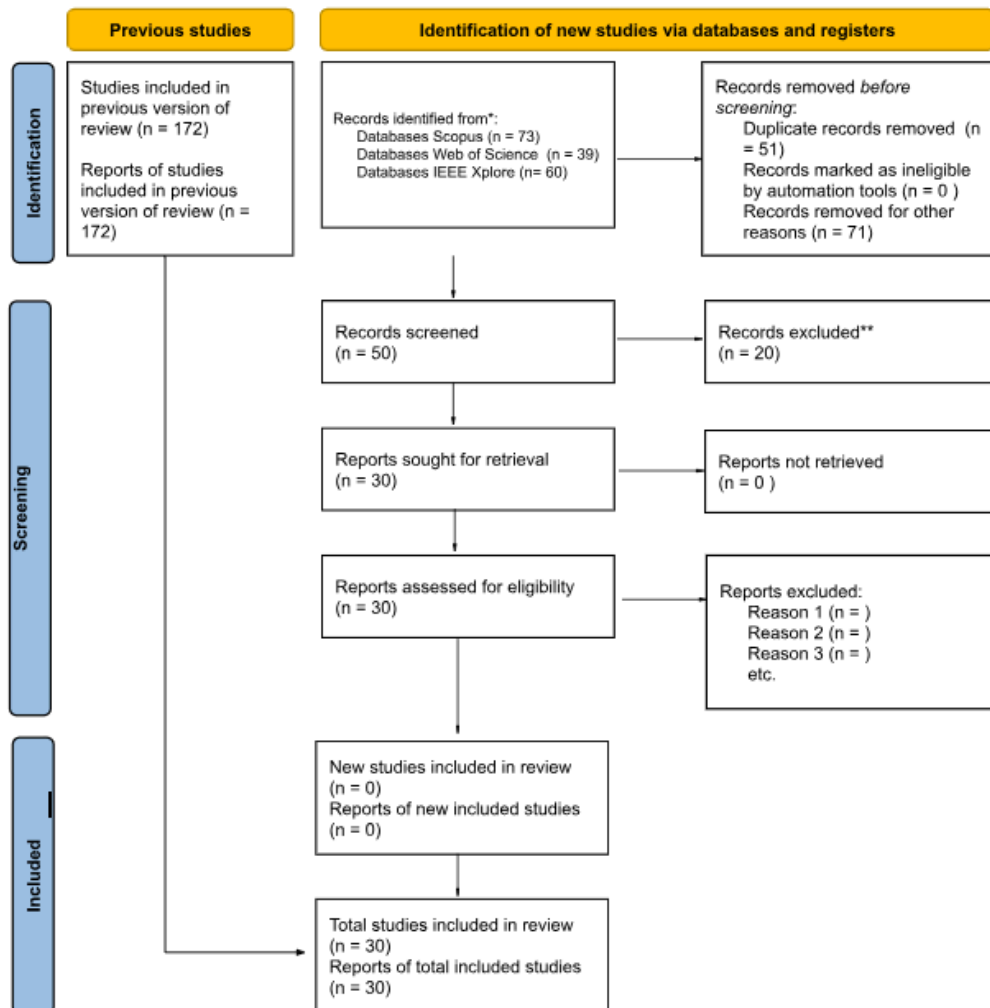
Election Systematic Literature Review (SLR) as a research method has several main justifications:

1. Avoiding Bias and Data Fragmentation

- By using SLR, this research integrates various studies that have been conducted, thereby avoiding bias that may arise from individual studies that only highlight certain aspects of DeFi.
- 2. Providing Evidence-Based Insights
 - SLR allows research to produce evidence-based findings stronger than individual studies. This is critical in understanding the complexity and impact of DeFi on the global financial system.
- 3. Helps Identify Research Gaps
 - Through a systematic analysis of existing literature, this research can identify areas that are still under-discussed and provide directions for future research.
- 4. Structured and Reproducible Method
 - Using the PRISMA method ensures that this research can be replicated by other researchers, thereby increasing the transparency and validity of research results.

With this methodological approach, research is expected to provide deeper insight into the potential, challenges and implications of DeFi developments on the global financial system.

Tabel 1. Prisma Diagram



Source: Data Processed, 2025

Based on the PRISMA diagram presented, the study selection process in this study began by identifying previous studies that had been included in previous reviews, with a total of 172 studies. Next, identification of new studies was carried out through databases such as Scopus (73 studies), Web of Science (39 studies), and IEEE Xplore (60 studies). From the total search results, 51 studies were removed due to duplication, and another 71 studies were removed for various reasons, leaving 50 studies for the screening stage. In the screening stage, 20 studies were removed, leaving 30 studies that then entered the further evaluation stage. All 30 studies were successfully obtained for further review. In the eligibility assessment stage, several studies were removed for certain reasons, but the specific number for each reason is not mentioned in the diagram. Ultimately, no new studies were included in the final review. Thus, the total number of studies included in this review was 30, which came from the previous review version. This diagram shows that despite the effort to search for new studies, no additional studies met the criteria for inclusion in the final review.

3. RESULTS

3.1. Key Findings

The results of this research identify various opportunities and risks inherent in Decentralized Finance (DeFi) systems. The main findings are based on a synthesis of literature obtained through a Systematic Literature Review (SLR) approach, with analysis of aspects of efficiency, accessibility, innovation, as well as regulatory and security challenges.

3.1.1. DeFi Opportunities

1. **Cost Efficiency and Faster Transactions Compared to Conventional Banks**
One of the main advantages of DeFi is its ability to reduce transaction costs by eliminating financial intermediaries such as banks and traditional financial institutions. Blockchain technology enables faster and cheaper transactions, especially for cross-border payments which in traditional systems often incur high fees and long processing times.
2. **High Accessibility for Individuals Who Do Not Have a Bank Account (Unbanked Population)**
According to data from the World Bank (2021), around 1.7 billion people in the world do not have access to banking services. DeFi offers a solution for this population by providing access to financial services with just an internet connection and a digital wallet (crypto wallet). Blockchain-based platforms do not require strict identity verification like conventional banks, making financial inclusion easier.
3. **Innovations in Yield Farming, Staking, and Lending Protocols**
DeFi introduces various new financial instruments such as yield farming, where users can earn profits by providing liquidity into DeFi protocols. Additionally, staking allows crypto asset holders to earn returns by locking their assets in a blockchain network. Lending protocols such as Aave and Compound allow users to borrow and lend assets in a decentralized manner without the involvement of third parties.

3.1.2. DeFi Risk

1. **Crypto Asset Volatility and High Liquidity Risk**
Although DeFi offers various advantages, the high price volatility of crypto assets remains a major challenge. The value of assets used in the DeFi ecosystem can fluctuate drastically in a short period of time, causing liquidity risks for users who invest or borrow assets through DeFi platforms.
2. **Regulatory Uncertainty in Various Countries**
Regulations on DeFi still vary widely across jurisdictions. Some countries such as the United States and the European Union are starting to design regulations to supervise

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DeFi activities, while other countries are still in the exploration stage or even prohibiting activities related to crypto assets. This uncertainty poses a risk to the widespread adoption of DeFi and has the potential to hinder the development of its ecosystem.

3. Security Threats (Hacking, Smart Contract Vulnerability)

One of the biggest challenges of DeFi is security risks, especially related to vulnerabilities in smart contracts. Many cases of cyberattacks have successfully exploited weaknesses in smart contract code, causing huge losses to users. For example, an attack on the DeFi platform Poly Network in 2021 resulted in the loss of more than \$600 million in digital assets.

3.2. Supporting Tables and Graphs

To support the above findings, several visual representations are presented to clarify the differences between DeFi and traditional financial systems, as well as show the growth trend and impact of DeFi in the global financial ecosystem.

Table 1: Comparison of DeFi vs. Traditional Finance

Aspect	DeFi	Traditional Finance
Transaction Fees	Low	High
Processing Time	Fast (real-time)	Time (depending on the institution)
Intermediary	None (peer-to-peer)	Yes (banks, fintech)
Accessibility	Open to anyone with internet	Requires documents and identification
Regulations	Minimal and not uniform	Regular and closely supervised
Security Risks	Tinggi (smart contract vulnerabilities)	Moderate (legal protection)

Source: Processed Data, 2025

A comparison between Decentralized Finance (DeFi) and traditional financial systems shows fundamental differences in various operational aspects. One of the main aspects is transaction fees, where DeFi tends to offer lower fees compared to traditional financial systems. This is due to the elimination of intermediaries and the use of blockchain technology which allows transactions to be carried out directly between users. In contrast, traditional financial systems often charge higher fees because they involve various financial institutions as intermediaries in the transaction process.

Besides that, processing time in DeFi is much faster compared to traditional finance. Transactions in DeFi can be processed in seconds or minutes in real-time thanks to the use of smart contracts that automatically execute orders without the involvement of third parties. In contrast, in traditional financial systems, transactions can take longer, depending on the internal procedures and operating hours of the financial institution concerned.

As an intermediary, DeFi operates in a decentralized manner without requiring a third party such as a bank or fintech as a fund manager. This peer-to-peer model gives users complete control over their own assets. In contrast, traditional financial systems still rely on various intermediaries who arrange transactions, providing additional security, but also increasing operational complexity and costs. In terms of accessibility, DeFi is more inclusive because it allows anyone with an internet connection to participate in financial services without requiring official documents or identity verification. This differs from traditional financial systems which impose strict requirements such as identity documents and credit history before someone can open an account or access financial services.

However, in case of regulations, DeFi still faces big challenges due to its minimal supervision and lack of uniform regulations in various countries. Meanwhile, the traditional financial system operates under strict regulations designed to protect consumers and ensure the stability of financial markets. Lastly, in terms of security risk, DeFi has a high vulnerability to cyberattacks and smart contract exploits. Lack of regulatory oversight also increases risks for investors. In contrast, traditional financial systems offer stronger legal protections as well as more established security mechanisms to prevent fraud and bankruptcy.

Taking these factors into consideration, DeFi and traditional finance each have advantages and disadvantages that need to be taken into account in adoption and implementation in the global financial system.

Table 2. Global DeFi Adoption Trends (2019-2024)

Year	Total Value Locked (TVL)
2019	\$1 billion
2020	\$15 billion
2021	\$170 billion
2022	\$192 billion
2023	\$133.88 billion
2024	\$192 billion

Source: DeFi Report, 2025

The global DeFi adoption trend experiences significant growth from 2019 to 2024, as shown in the increase in Total Value Locked (TVL). In 2019, the value of assets locked in the DeFi ecosystem was still relatively small, namely approx \$1 billion. However, as awareness and interest in blockchain-based financial services increases, this number has increased drastically \$15 billion in 2020. The peak of growth occurs in 2021, where TVL reaches \$170 billion, which marks a huge spike in user participation and increased adoption of various DeFi protocols, such as lending, staking, and yield farming. The growth trend continues in 2022, with TVL reaching an all-time high of \$192 billion, reflecting the market's confidence in DeFi as an efficient and decentralized financial alternative.

However, 2023 shows a significant decline in TVL to \$133.88 billion, which was likely caused by crypto market volatility, stricter regulations, as well as several security incidents that reduced user confidence. However, in 2024, TVL will return to normal \$192 billion, which indicates a stabilization and recovery of interest in DeFi, driven by technological innovation, integration with the traditional financial sector, and increasing regulations that provide legal clarity for industry players. Overall, these trends show that despite fluctuations in the DeFi ecosystem, long-term growth remains positive with strong prospects for continued growth in the future.

These findings show that DeFi has great potential in creating a more inclusive, efficient and innovative financial system. However, key challenges such as asset volatility, regulatory uncertainty and security risks remain barriers to widespread adoption. Therefore, a deeper understanding of the DeFi ecosystem is necessary to optimize its benefits while overcoming the existing risks. These findings will be analyzed further in the Discussion section, which will link the practical and academic implications of DeFi and its potential evolution in the future.

4. DISCUSSIONS

4.1. Interpretation of Findings

Exploration of Decentralized Finance (DeFi) shows its substantial potential in enhancing traditional financial systems without completely replacing them. Key findings indicate that DeFi can improve transaction efficiency, characterized by lower fees and higher processing speed—factors that are crucial in expanding market access and increasing the usability of financial systems (Muhammad et al., 2024; MNOHOGHITNEI et al., 2022). The DeFi movement emphasizes innovation, which in many ways contrasts with conventional banking approaches that focus more on regulatory oversight and stability. The contrast between these two paradigms creates both opportunities and challenges that need to be analyzed carefully (Singh, 2024; Schär, 2021).

One of the main advantages of DeFi is its ability to expand financial inclusion, especially for individuals who do not have access to banking services. By reducing barriers, DeFi platforms enable access to a variety of financial services for groups that have been marginalized in the traditional banking system. This platform opens up new financial opportunities, such as yield farming, staking, as well as various lending protocols, which further increase the attractiveness of the DeFi ecosystem (Ozili, 2022; Xu & Feng, 2023). Furthermore, increasing participation in DeFi reflects growing investor interest, driven by innovations in asset management and the development of decentralized financial applications (Ozili, 2022).

However, despite its promising prospects, DeFi also faces a number of significant risks. One of the main challenges is the volatility of crypto assets as well as vulnerabilities in smart contracts that can pose risks for users and investors. Regulatory uncertainty further complicates this landscape, as jurisdictions are still working to design comprehensive methodologies for integrating DeFi within existing legal frameworks (Benson et al., 2024; Adisa et al., 2024; Weingärtner et al., 2023). This uncertainty not only hinders wider adoption, but also poses challenges to the stability and sustainability of DeFi protocols in the face of regulatory dynamics and market volatility (Weingärtner et al., 2023; Alamsyah et al., 2024). Therefore, the future sustainability of DeFi depends heavily on the ability to balance innovation with strong regulation, to protect users while enhancing transaction security (MNOHOGHITNEI et al., 2022; Meyer et al., 2021).

In conclusion, DeFi offers great potential as a complement to traditional financial systems, providing improvements in efficiency and accessibility. However, existing challenges need to be overcome through a balanced approach between developing innovation and implementing appropriate regulations. The evolution of DeFi will continue to evolve, influenced by technological advances as well as ongoing debate over regulatory approaches. Thus, the relationship between DeFi and traditional financial systems will remain dynamic and complex for the foreseeable future.

4.2. Comparison with Previous Studies

The current landscape of Decentralized Finance (DeFi) clearly showcases a dynamic interplay between efficiency and institutional hesitance rooted in regulatory uncertainties. Despite the apparent advantages of DeFi over traditional financial systems, such as reduced transaction costs and increased accessibility, financial institutions often display resistance to its adoption. This reluctance is largely attributed to legal ambiguities that govern these financial structures, as well as the threat of disintermediation that disrupts the longstanding business models of banks and financial intermediaries. As highlighted by Grassi et al., DeFi can disrupt traditional mediation practices, yet evidence suggests that intermediary roles are simply evolving instead of being entirely eliminated, necessitating a re-examination of its implications for financial intermediation (Grassi et al., 2022).

In the context of legal frameworks, research indicates that clarity in cryptocurrency regulations has notably improved investor confidence in DeFi. Studies conducted in varying

jurisdictions, including the European Union and the United States, underscore the importance of regulatory frameworks in instilling market stability (Muhammad et al., 2024). Ahmed et al. explain how effective regulations can bolster trust in DeFi platforms and encourage broader acceptance, despite some potential drawbacks associated with decentralization itself (Ahmed et al., 2023). Similarly, Kwon points to the necessity of establishing clear regulatory guidelines to facilitate secure decentralized lending, thereby promoting a more reliable environment for users and investors (Kwon, 2023). Establishing structured regulations seems key to increasing legitimacy and wider acceptance of DeFi, as observed by various scholars advocating for a balanced approach that fosters innovation while ensuring consumer protection (Adisa et al., 2024; Muralidhar & Lakkanna, 2024).

The tension between regulatory oversight and the intrinsic nature of DeFi underscores a broader challenge where the evolution of regulatory practices serves not only to protect investors but also to enhance the legitimacy of these emerging financial ecosystems. Regulatory frameworks can reflect a middle ground that allows both the decentralization of finance and sufficient oversight to mitigate risks associated with fraud and abuse (Alamsyah et al., 2024). Zetzsche et al. emphasize the need for regulations tailored specifically for DeFi, proposing a concept of 'embedded regulation' which can evolve alongside decentralized financial mechanisms (Zetzsche et al., 2020). Delineating these frameworks could thus serve as a pivotal foundation for the increasing convergence of traditional finance and DeFi, reinforcing the notion that while DeFi presents opportunities, it also necessitates a sound regulatory environment to prosper sustainably (OECD, 2022; Smith, 2021). In summary, while DeFi offers promising efficiencies and opportunities for transformation in financial services, it is clear that regulatory clarity and structured policies are vital in supporting its growth and acceptance. Well-thought-out regulations can play an instrumental role in enhancing investor confidence, securing institutional adoption, and ultimately legitimizing the DeFi space within the broader financial ecosystem.

4.3. Academic & Practical Implications

Academically, this research contributes to the growing literature on the integration of DeFi in the global financial system. The results of this research show that DeFi is not just a technology trend, but a phenomenon that has the potential to fundamentally change the financial landscape. Thus, further research is needed to explore integration models between DeFi and traditional finance. From a practical perspective, the results of this research provide insight for regulators and financial institutions considering hybrid business models. This model allows banks and financial institutions to leverage the advantages of blockchain technology in financial transactions, while remaining within the existing regulatory framework. This approach can create a more inclusive ecosystem, where DeFi and traditional financial systems can collaborate to increase transaction efficiency and security.

4.4. Research Limitations

Although this study provides valuable insights, there are several limitations that need to be noted. First, this research focuses more on academic literature and does not directly explore the perspectives of industry practitioners, such as DeFi developers, regulators, and investors. Therefore, the results of this research are still conceptual and do not fully reflect the real dynamics of the DeFi market. Second, the lack of longitudinal data is an obstacle in understanding the long-term development of DeFi. Because DeFi is still a relatively new phenomenon, regulatory changes and technological innovation could quickly transform this ecosystem. Therefore, research with a longer time span is needed to understand long-term trends and their impact on the global financial system.

4.5. Recommendations for Further Research

Based on the limitations that have been identified, several recommendations for further research can be provided. First, further empirical studies are needed that explore the impact of regulatory policies on DeFi adoption rates. This study can help understand how different policies in different countries influence the development and sustainability of the DeFi ecosystem. Second, future research could explore hybrid business models that combine the advantages of DeFi and traditional financial systems. This model can include approaches to centralized finance (CeFi) which adopts blockchain technology but remains under stricter regulations. As such, further research is expected to provide more comprehensive insight into how DeFi can develop as part of a more inclusive and sustainable global financial ecosystem.

5. CONCLUSION

5.1. Summary of Key Findings

This research highlights the role Decentralized Finance (DeFi) in the global financial ecosystem, emphasizing its potential and accompanying challenges. DeFi offers higher cost efficiency, wider accessibility, and transparency in financial transactions. By eliminating intermediaries, DeFi enables faster transactions and lower fees compared to traditional financial systems. In addition, innovation in yield farming, staking, And lending protocols has opened up new investment opportunities that were previously unavailable in conventional financial markets.

However, this research also reveals various challenges faced by the DeFi ecosystem, especially in terms of regulation, crypto asset volatility, and security risks. Regulatory uncertainty in various countries hinders the widespread adoption of DeFi, while security threats such as hacking and weaknesses in smart contracts can cause huge losses to users. Therefore, although DeFi has the potential to complement traditional financial systems, these challenges must be overcome for DeFi adoption to occur in a sustainable and secure manner.

5.2. Research Implications

5.2.1. Academic Implications

From an academic perspective, this research contributes to the growing literature on DeFi by providing a systematic analysis of its advantages and limitations in the global financial system. This study expands understanding of how DeFi can serve as a complement, rather than a total replacement, of traditional financial systems. Additionally, this research opens up opportunities for further exploration of hybrid models that integrate the best aspects of traditional finance and DeFi to create a more inclusive and efficient financial system.

5.2.2. Practical Implications

Practically, the results of this research have a significant impact on regulators, investors and financial industry players. For regulators, this research highlights the need for a more adaptive and standardized regulatory approach to managing the risks associated with DeFi. Meanwhile, for investors, insight into the risks and opportunities of DeFi can help in making wiser investment decisions. Additionally, traditional financial institutions may consider adopting some DeFi technologies and principles to improve the efficiency of their services and reach a wider market.

5.3. Recommendations for the Future

To ensure the continued development of DeFi, several key recommendations can be considered:

1. Development of a Global Regulatory Framework Clear and standardized regulations at a global level are urgently needed to ensure the stability and security of the DeFi

ecosystem. This approach must include a balance between consumer protection, technological innovation, and compliance with existing regulations.

2. Empirical Research on the Impact of DeFi on Economic Stability Further studies are needed to explore how DeFi adoption affects global economic stability, including its impact on monetary policy, central banking, and financial stability.
3. Strengthening Security in DeFi Infrastructure With increasing security threats such as exploits smart contracts and attack hacking, further research on strengthening the technological infrastructure in DeFi is urgently needed. Development of automated audit systems and improvements in cybersecurity is an aspect that must be prioritized.
4. Exploration of Hybrid Financial Models Future research could examine hybrid models that combine the advantages of DeFi with the security and stability offered by traditional finance. This model can create a more inclusive and efficient financial system without ignoring aspects of regulatory compliance.

Overall, DeFi has great potential to revolutionize the financial system, but a structured and scalable approach is needed for this innovation to develop safely and sustainably. With clearer regulations, increased security, and deeper research, DeFi could become an integral element in the global financial ecosystem of the future.

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