ISSN 1533-9211
DOI: 10.5281/zenodo.10071194

FINTECH SUSTAINABILITY AND FINANCIAL FRAUD PREVENTION: A STUDY IN THE CONTEXT OF SAUDI ARABIA

Dr. MARIM ALENEZI

Assistant Professor, Department of Accounting and Finance, College of Business Administration, Prince Mohammad Bin Fahd University, Al-Khobar, Saudi Arabia. Email: marimalenezi@gmail.com

Abstract

This study examines the relationship between the sustainability of financial technology (FinTech) and financial fraud deterrence. FinTech has chance to promote sustainable finance and condense financial fraud, which ultimately contributes to the financial system's integrity. Many reports and other sources of information regarding financial service providers and regulators in the FinTech industry were utilized to collect the secondary data. FinTech can improve the sustainability of economic systems and reduce the incidence of fraud by providing advanced security features as well as effective payment systems, according to the outcomes of the study. FinTech may improve financial transaction transparency, accountability, and ecological sustainability. In addition, the study demonstrates that regulatory organizations play a crucial role in promoting the viability of FinTech and preventing financial fraud. The study suggests that sources of financial services ought to develop FinTech solutions that incorporate advanced security features, efficient payment systems, transparency, and environmental sustainability. In addition, regulatory agencies should provide a robust legal and regulatory structure to promote the sustainability of FinTech. Additionally, consumers should be offered education and awareness programs regarding FinTech sustainability and fraud prevention. The key finding of the study is that FinTech has the potential to completely transform the financial system by increasing sustainability and decreasing fraud. However, stakeholders in the FinTech industry must collaborate to surmount the challenges and capitalize on all the possibilities that FinTech presents.

Keywords: Fintech, Sustainability, Financial Fraud, Financial Service Providers, Regulatory Bodies, Advanced Security Features.

1. INTRODUCTION

1.1 Fintech

Fintech is an information technology to deliver financial services to organizations and individuals. In recent years, the FinTech industry has grown in popularity, with advances in technology such as mobile banking, crypto currency, and artificial intelligence sustaining innovation in financial services (Abu Daqar, Arqawi, & Karsh, 2020). One of the critical drivers of FinTech growth has been the demand for greater efficiency, transparency, and convenience in financial transactions (Belozyorov, Sokolovska, & Kim, 2020). Also (Razak, Dali, Dhillon, & Manaf, 2021) state that Fintech companies are disrupting traditional financial institutions by offering new ways to access and manage personal and business finances, from online lending platforms and digital wallets to robo-advisors and automated invoicing systems. Fintech has also enabled greater financial inclusion, providing access to financial services for millions of people who traditional banks previously underserved (Ozili, 2018, 2020) argue in their study. In emerging markets, FinTech has allowed mobile payments, microcredit, and other financial services to be delivered via smartphones and other mobile devices (Pompella & Costantino,

ISSN 1533-9211
DOI: 10.5281/zenodo.10071194

2021). Despite its many benefits, FinTech has its challenges. The rapid pace of technological change has challenged regulators' ability to keep pace with developments (Mangini, da Silva, & de Carvalho, 2021; Mauladi, Jaya, & Esquivias, 2022). At the same time, concerns about cyber security and data privacy have raised questions about the safety of online financial transactions (Mavlutova et al., 2021). Fintech is set to continue reshaping the financial sector, transforming how we borrow, lend, save, and invest our money (Lorenzo & Arroyo, 2022; Mosteanu & Faccia, 2021; Muganyi et al., 2022). As technology continues to evolve, the potential for new FinTech breakthroughs is enormous, with opportunities for more incredible financial innovation and inclusion on the horizon (Iddrisu, Abor, & Banyen, 2022).

1.2 Fintech Sustainability

Fintech sustainability navigates financial technology innovation's prolonged-term viability, impact and influence on the environment and society (Abdulla, Khaled, Mohd, Hamdan, & Akeel, 2023). It stresses the essence of assessing the environmental, social, and governance (ESG) characteristics when conceiving and executing financial and technological solutions (Dhali, Hassan, Mehar, Shahzad, & Zaman, 2023). Fintech enterprises increasingly integrate ESG procedures and approach into their business models to address issues like climate change, social inequality, and ethical governance (Guang-Wen & Siddik, 2023). Also they (Zalewska, 2023) state for instance, sustainable FinTech solutions like green finance products, digital microfinance, and result investing are geared towards promoting sustainable economic growth, lessening poverty, and combating climate change. Moreover, FinTech sustainability assures ethical and translucent financial practices, encouraging accountability and protecting customers' interests (Widagdo & Sa'diyah, 2023; Yi, Rom, Hassan, Samsurijan, & Ebekozien, 2023). This is achieved through implementing regulatory measures, such as data privacy and security, anti-money laundering (AML), and consumer protection law (Awais, Afzal, Firdousi, & Hasnaoui, 2023; Mapanje, Karuaihe, Machethe, & Amis, 2023). Fintech sustainability promotes long-term, socially accountable, and sustainable financial innovation (Mirza, Umar, Afzal, & Firdousi, 2023). It is critical for the evolution and expansion of the FinTech industry and its contribution to society and the environment (Siddik, Yong, & Rahman, 2023)t.

1.3 Financial Fraud Prevention

Financial fraud deterrence is a group of measures to control fraud in financial transactions. Financial fraud can be committed in different ways, such as credit/debit card fraud, identity theft, phishing scams, insider trading, foreign exchange fraud, and money laundering (Arner, Zetzsche, Buckley, & Barberis, 2019; Bhat, AlQahtani, & Nekovee, 2023; Botchey, Qin, & Hughes-Lartey, 2020). Businesses negotiating with financial transactions, such as banks and credit card companies, are accountable for safeguarding their customers' funds and personal information from fraud. Proper measures are implemented to ensure that fraudsters do not attain access to sensitive facts and information discuss in their study (Dudin & Shkodinsky, 2022).

ISSN 1533-9211
DOI: 10.5281/zenodo.10071194

One of the ways that financial fraud prevention is executed is via the enactment of vigorous authentication protocols. Customers must deliver extra verification when accessing their accounts, such as a unique password, biometric fingerprint, or security token (Lee, Li, & Shin, 2022). These authentication benchmarks make it challenging for fraudsters to access reports, even if they have acquired a customer's personal information (Griffin, Kruger, & Mahajan, 2023).

Another expected and common feature in financial fraud prevention is fraud detection software. This software scrutinizes customer transactions, looking for patterns indicating fraudulent activity. If such behavior is detected, the software may flag the transaction, which a human analyst can review (Omodero, 2021). In terms of credit and debit card fraud prevention, card companies continually monitor customer purchases for any questionable activity (Esmat, de Vos, Ghiassi-Farrokhfal, Palensky, & Epema, 2021; Griffin et al., 2023). These transactions can be flagged if they fall outside the customer's spending patterns. Additionally, card companies may utilize machine learning algorithms to interpret enormous amounts of data and determine fraudulent approaches (Pang, Li, Van Den Hengel, Cao, & Dietterich, 2021). Regular monitoring and auditing of financial systems, both for banking and non-banking commodities, are required to recognize any new changes and gaps in security measures (Yang, Chen, Bai, & Chen, 2020; Zhao, Hou, An, Liu, & Zhang, 2021). Financial fraud prevention strategies need to be committed and elegant in order to meet the ever-changing tactics of fraudsters (Mhlanga, 2020). Financial fraud prevention is a critical component in retaining the security and integrity of financial transactions (Yang et al., 2020). Through the implementation of strong authentication protocols, fraud detection software, and regular education and training programs, companies can minimize the possibility of fraud, thus safeguarding their customer's finances (Panos & Wilson, 2020). Further added by (Wang, 2018) as fraudsters are constantly evolving their tactics, it is essential to stay proactive and ensure that fraud prevention measures are kept up-to-date with time.

2. REVIEW OF LITERATURE

Financial technology (FinTech) has been a driving force in supporting sustainability measures all around the world (Bozkuş Kahyaoğlu, 2022). There has been a significant surge in financial companies and entrepreneurs delivering sustainable solutions in recent years (Yeow, Lee Kuo Chuen, Tan, & Chia, 2018). Venture capitalists, governments, and traditional financial institutions have supported these initiatives considerably (Teichmann, Boticiu, & Sergi, 2023). One area that has seen significant innovation in digital payments. Digital payment platforms enable individuals and businesses to conduct transactions without needing physical currency, reducing their carbon footprints. Providers such as PayPal, Venmo, and Ali Pay have been widely adopted globally, significantly reducing carbon emissions related to cash handling (Dudin & Shkodinsky, 2022).

Another area where FinTech has significantly impacted sustainability is green finance. Fintech ventures have devised innovative ways to invest in environmentally sustainable projects through micro-lending and crowd funding platforms. Such platforms as Sun Funder, Kiva, and

The Seybold REPORT
ISSN 1533-9211
DOI: 10.5281/zenodo.10071194

Abundance Investments have leveraged technology to enable retail investors to participate in financing clean energy projects (Thompson & Rust, 2023). Fintech has also brought significant changes to supply chain finance, enabling businesses to adopt sustainable practices (Shrestha, Naysary, & Philip, 2023). By providing quick access to funds, supply chain finance has allowed suppliers to invest in energy-efficient equipment, thereby reducing energy consumption and carbon footprints (Moccia, García, & Tomic, 2021; Tepe, Geyikci, & Sancak, 2022). Moreover, FinTech is now playing a critical role in mitigating climate risks. As climate change threatens economies, FinTech ventures have utilized big data and machine learning to develop risk assessment tools for companies. Such solutions facilitate the analysis of climate risks for businesses and help them in developing sustainable practices (Khilfah & Faturohman, 2020; Mapanje et al., 2023). Fintech has had a significant impact on promoting sustainability measures globally (L. T. N. Le, Yarovaya, & Nasir, 2021). By developing innovative solutions across various financial services, the industry has brought efficiencies and transparency, enabling businesses to adopt eco-friendly practices (Lisha et al., 2023). Fintech, or financial technology, has recently transformed the financial industry as mentioned by (Lee et al., 2022). As the popularity of Fintech grows, there is rising concern about how it may affect sustainability and financial fraud prevention (Okoli, 2020).

Fintech has the potential to develop a more environmentally friendly financial system in terms of sustainability (Noreen, Mia, Ghazali, & Ahmed, 2022). Adoption of digital payments, for example, can reduce paper waste from checks and receipts (Saka, Eichengreen, & Aksoy, 2022). Furthermore, Fintech solutions that enable remote work and virtual meetings might eliminate the need for physical travel, hence lowering carbon footprints (Sapulette, Effendi, & Santoso, 2021).

Fintech, on the other hand, carries long-term hazards. One concern is that Fintech solutions may not be gas-efficient, resulting in increasing energy usage and carbon emissions (Siddik et al., 2023; Stojanović & Božić, 2022). Another danger is the increasing demand for electronic devices to support Fintech solutions, which can add to electronic waste and environmental degradation as argued by (Suryanto, Muhyi, Kurniati, & Mustapha, 2022). Fintech, or financial technology, has recently transformed the financial industry (Wijaya, Zunairoh, Rianawati, Prasetyo, & Harianto, 2022). As the popularity of Fintech grows, there is rising concern about how it may affect sustainability and financial fraud prevention. On the basis of review of literature the study explores following objectives of study (Yoon & Lim, 2020)

As per the review of the literature, it has been noticed that very few studies have been done previously regarding Saudi Arabia, which has witnessed enormous growth and further prospects in the field of FinTech sustainability and financial fraud prevention. Therefore, this study finds a research gap and further facilitates researchers and other readers from industrial economic backgrounds to fill this gap by fulfilling the objectives below.

ISSN 1533-9211
DOI: 10.5281/zenodo.10071194

2.1 Objectives of the Study

- To understand the current state of FinTech sustainability in Saudi Arabia
- To analyze how FinTech impacts financial fraud prevention
- To evaluate the effectiveness of current fraud prevention measures within the FinTech context.

3. RESEARCH METHODOLOGY

The research objectives have already been identified in the study. These objectives will act as an escort in determining secondary data sources and analyzing and interpreting the data.

Step 1: Determinate relevant secondary data sources that provide information on the following areas:

- FinTech sustainability in Saudi Arabia
- The Influence of FinTech on financial fraud prevention
- The usefulness of existing fraud prevention measures within the framework of FinTech

These sources may include academic journals, reports, government reports, and other publications in the concerned field.

Step 2: Review and select data sources

Ensure they contain information relevant to the research questions and objectives. The data sources will be selected based on relevance, reliability, and validity.

This research methodology on secondary data analysis will provide valuable insights into the current state of FinTech sustainability in Saudi Arabia and the impact of FinTech on financial fraud prevention. The results of this study will be helpful to policymakers, regulators, financial institutions, and consumers.

4. CURRENT STATE OF FINTECH SUSTAINABILITY IN SAUDI ARABIA

The FinTech industry in Saudi Arabia is rapidly extending with a priority on sustainability. The Saudi Arabian Monetary Authority (SAMA) supports several initiatives to encourage and facilitate the evolution of sustainable FinTech solutions. For example, the Financial Sector Development Program of Saudi Arabia seeks to improve the function of innovative technologies in sustainable finance (Dehghani, Karavidas, Panourgias, Hutchinson, & Reilly, 2023).

Moreover, the Saudi government is dedicated to promoting sustainable development and has embarked on initiatives such as “Vision 2030” to diversify the economy and reduce reliance on oil. This vision also encourages using renewable energy, conserving natural resources, and lowering carbon emissions (Chen, Deakin, Johnston, & Wang, 2021).

ISSN 1533-9211

DOI: 10.5281/zenodo.10071194

Several FinTech startups in Saudi Arabia focus on sustainability, such as Wrappup, which enables paperless meetings, and ONEGCC, which specializes in green energy and sustainability financing. Also, SAMA has established “Fintech Saudi,” a platform offering regulatory assistance and mentorship to FinTech startups, including those concentrated on sustainability (Dhali et al., 2023).

Apart from that the FinTech industry in Saudi Arabia is committed to building a sustainable future through innovative and technology-driven solutions. The government’s obligation to drive sustainable development and the boost in FinTech startups focusing on sustainability is a positive trend for the country (Dudin & Shkodinsky, 2022).

FinTech (financial technology) is a creative and sustainable path to financial services that enhances efficiency, reduces costs, and increases the amenity of financial transactions (Łasak, 2022). In Saudi Arabia, embracing FinTech provides tremendous blessings and possibilities for both businesses and consumers, contributing to the sustainability of the financial sector (T. N. L. Le, Abakah, & Tiwari, 2021).

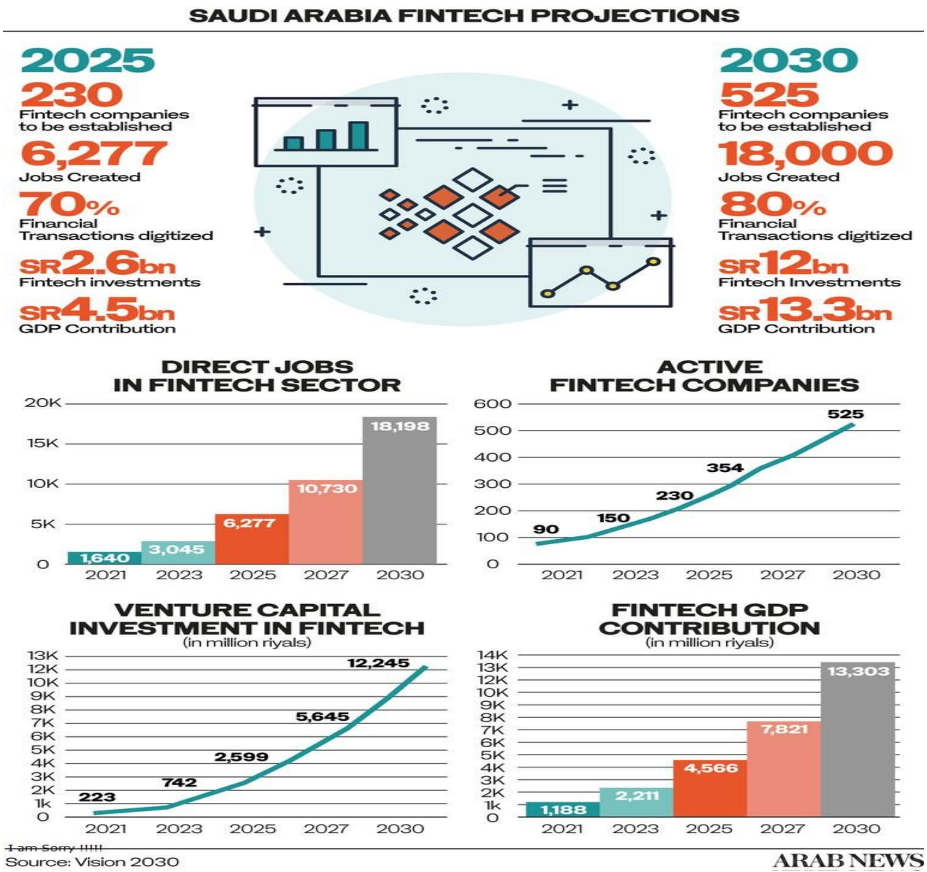

Figure 1: Current state of FinTech Sustainability in Saudi Arabia

(Source Arab news: 2023)

ISSN 1533-9211
DOI: 10.5281/zenodo.10071194

4.1 Analysis

Saudi Arabia campaigns to enhance the number of FinTech companies in the Kingdom by fourfold under a new national strategy. The Ministry of Finance stated in a statement that under the new FinTech strategy the number of firms is anticipated to increase from 83 to 230 by 2025.It also seeks to increase FinTech sector's contribution to the gross domestic product to SR4.5 billion and create nearly 6,000 jobs by 2025.The plan also focuses to increase the share of digital transactions to 70 percent of all financial dealings by 2025. The strategy seeks to enhance the cumulative value of venture capital investments in FinTech companies to reach from SR2.6 billion ($1 billion) by 2025 in an effort to lift domestic and foreign investment. The strategy will contribute to increasing the number of FinTech actors in the Kingdom to 525, and create nearly 18,000 jobs by 2030.In addition to raising the sector's contribution to the GDP to SR13.1 billion ($3.46 billion) by 2030, the new plan also targets at increasing investments in FinTech companies to SR12 billion.

4.2 Benefits from FinTech Sustainability in Saudi Arabia

One of the benefits of FinTech sustainability in Saudi Arabia is the accessibility it contributes to the unbanked and under banked population. With over 70% of Saudi Arabia's population being young and tech-smart, adopting technologies like mobile banking, online payments, and digital wallets might fetch financial services nearer to the people, thereby delivering better inclusive financial access to all (Lebichot et al., 2021; Lee et al., 2022).

The usefulness of FinTech can also assist in undervaluing unauthorized or deceitful shifting. Saudi Arabia has been known to be a potential destination for financial crimes such as money laundering and terrorism financing (L. T. N. Le et al., 2021). However, implementing FinTech solutions delivers a safer and more secure process for money transfers and payments while minimizing fraud and money laundering risks (Mariani, Polinesi, & Recchioni, 2022).

Also, FinTech solutions have enabled the extension of transparency and accountability in the financial sector, thereby contributing to the industry's overall sustainability. These technologies can track and monitor financial transactions in real time, reducing the likelihood of corruption or discrepancies in the financial system (Felipe, Mendes-Da-Silva, Leal, & Braun Santos, 2022).

Another benefit of FinTech sustainability in Saudi Arabia is its increased efficiency in financial transactions. Formal financial services may be time-consuming and usually apply manual processing, directing to inefficiencies in the system (Charaia, Chochia, & Lashkhi, 2021). However, with FinTech, transactions can be completed in seconds, annihilating waiting times and lowering the operational costs associated with traditional financial services.

FinTech sustainability in Saudi Arabia offers miscellaneous usefulness, including improved financial inclusion, augmented clarity and accountability, enhanced efficiency, and reduced fraud and money laundering. By embracing FinTech, Saudi Arabia can create a more stable and sustainable financial sector that provides its inhabitants with better and more secure services.

ISSN 1533-9211
DOI: 10.5281/zenodo.10071194

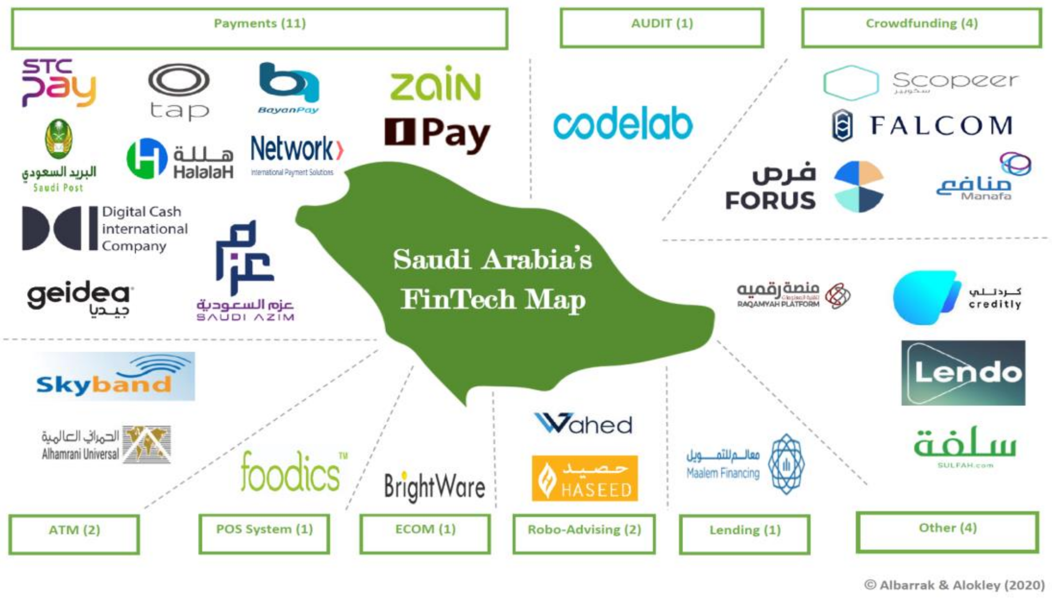

Figure 2: FinTech infrastructure benefits in Saudi Arabia

Source: https://www.mdpi.com/1911-8074/14/10/460

4.3 Analysis

In line with Saudi Arabia's Vision 2030, FinTech sustainability plays a crucial role in enhancing financial inclusion and accessibility to the unbanked and under-banked population in the country. The country's large youth population and its tech-savvies make it a perfect opportunity to adopt digital platforms such as mobile banking, online payments, and digital wallets, which can remarkably improve access to financial services access. By embracing FinTech sustainability, Saudi Arabia will be able to achieve its goal of promoting financial inclusion, increasing economic diversification, and boosting its overall economic growth.

4.4 FinTech Impacts Financial Fraud Prevention

When it comes to the financial sector, FinTech has been revolutionary, and Saudi Arabia is no exception. It has made a significant contribution to the fight against financial fraud nationwide .FinTech's rapid adoption has hastened the process of digitizing banking, reducing costs and increasing client convenience (Currie, Gozman, & Seddon, 2018; de Jesús González, Valdés Medina, & Saavedra García, 2021). Because of this, more and more business is being conducted online, which raises the stakes for financial crime. However, with the rise of FinTech, new approaches to this issue have become available as stated by (Chinoda & Mashamba, 2021).

FinTech has helped Saudi Arabia significantly reduce financial fraud by employing cutting-edge technology like machine learning, AI, and blockchain. Thanks to these developments, financial institutions can implement cutting-edge, highly effective fraud protection procedures previously unavailable to them (Chinoda & Mashamba, 2021).

ISSN 1533-9211
DOI: 10.5281/zenodo.10071194

For instance (Boot, Hoffmann, Laeven, & Ratnovski, 2021) argue machine learning algorithms can spot out-of-the-ordinary spending habits, halting any fraudulent purchases in their tracks. Successful fraud efforts have been drastically decreased, saving businesses and people millions.

The introduction of FinTech has accelerated the digitalization of financial services, making them more accessible and convenient for customers. This has led to an increase in online transactions, which has increased the risk of financial fraud. However, the emergence of FinTech has also delivered innovative solutions to tackle this problem (Asif, Khan, Tiwari, Wani, & Alam, 2023).

One of the most noteworthy contributions of FinTech to financial fraud prevention in Saudi Arabia is the use of state-of-the-art technologies such as machine learning, artificial intelligence, and blockchain (Bakri, Almansoori, & Azlan, 2023). These technologies have facilitated financial institutions to enforce sophisticated fraud prevention measures more effectively than traditional methods (Banna & Alam, 2021).

For example, machine learning algorithms are used to detect abnormal transaction patterns, flag suspicious activity, and prevent fraudulent transactions before they occur. This has significantly reduced the number of successful fraud attempts, saving millions of dollars for financial institutions and individuals' alike. FinTech has revolutionized finance, and Saudi Arabia is no longer an outlier. Over the past decade, it has mainly influenced financial fraud prevention (Asmarani & Wijaya, 2020). FinTech has expedited financial services' digitalization, making them easier for customers (Ferreira & Pereira, 2018). Online transactions have increased financial fraud risk. FinTech has offered novel solutions to this issue.

Machine learning, artificial intelligence, and blockchain have helped FinTech combat financial crime in Saudi Arabia (Bakri et al., 2023). These technologies allow financial institutions to employ sophisticated fraud prevention strategies that are more successful. Machine learning algorithms can spot unusual transaction patterns and avoid fraud. Financial organizations and individuals have saved millions of dollars through decreased fraud efforts.

4.5 Effectiveness of Current Fraud Prevention Measures within the FinTech Context

In recent years, the FinTech industry has risen exponentially, disrupting traditional financial services and altering how individuals interact with their finances (Chung, Kim, Lee, & Oh, 2023). Nevertheless, this growth has also conveyed new security threats, raising the demand for enhanced fraud prevention standards. In Saudi Arabia, contemporary fraud prevention measures within the FinTech context are crucial for the industry's sustained growth and for ensuring customers' safety. One of the primary fraud deterrence standards in Saudi Arabia's FinTech industry is the enactment of Know Your Customer (KYC) policies (Alam, Awawdeh, & Muhamad, 2021; Ali, Simboh, & Rahmawati, 2023; Awais et al., 2023).

These policies need customers to furnish detailed identification information, including national identification numbers, address information, and biometric data. This data is verified and authenticated, permitting banks and FinTech companies to guarantee that customers are who

The Seybold Report
ISSN 1533-9211
DOI: 10.5281/zenodo.10071194

they claim to be (Iddrisu et al., 2022). Another widely embraced benchmark in Saudi Arabia is Two-Factor Authentication (2FA). 2FA instructs users to deliver two different forms of authentication before accessing their accounts (Ali et al., 2023). This dissuades attackers from accessing accounts even if they have obtained the user's login credentials. 2FA is particularly effective in preventing phishing attacks and identity theft (Abdulla et al., 2023). In addition, the use of data analytics and machine learning plays an important role in detecting fraud in real-time.

Machine learning algorithms can learn from historical data to identify patterns and anomalies that may indicate fraudulent activity (Ozili, 2021). This allows financial institutions to quickly detect and respond to fraudulent activity before significant damage can occur. Despite the effectiveness of these measures; there are still some challenges that need to be addressed (Pang, Li, Van Den Hengel, Cao, & Dietterich, 2022). For instance, there is a lack of standardization across different FinTech companies, making it difficult to create a comprehensive fraud prevention framework. Cybercriminals are also developing sophisticated new tactics, which require more advanced technologies to detect and prevent. In conclusion, the FinTech enterprise in Saudi Arabia has made momentous strides in designing efficacious fraud-precluding measures. KYC policies, 2FA, and machine learning algorithms have proven effective in controlling fraud and augmenting security (Hua & Huang, 2021). Nevertheless, as cyber threats become more complex, there is a need for continuous improvement and invention to ensure the safety of consumer data and the continued growth and development of the industry.

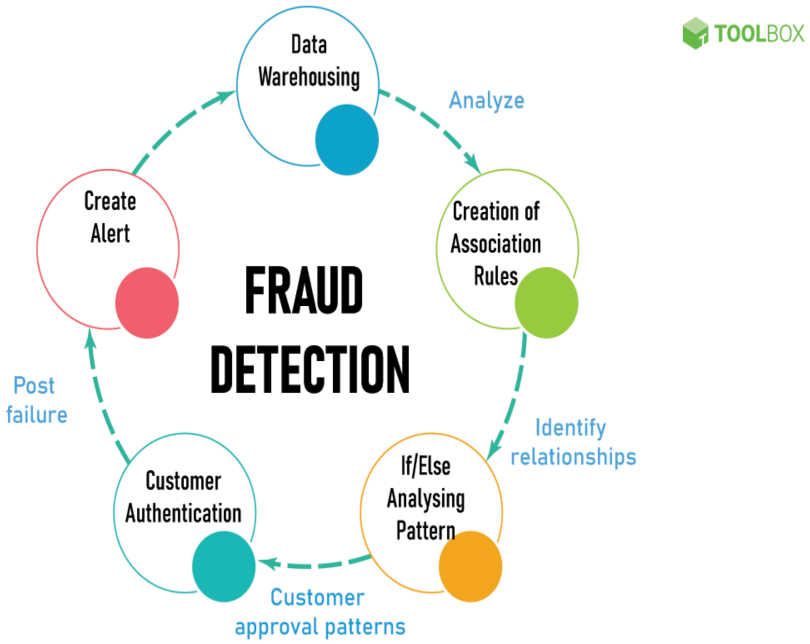

Figure 3: Current Fraud Prevention Measures

Source: Author's Creation

ISSN 1533-9211
DOI: 10.5281/zenodo.10071194

4.6 Analysis

The adoption of FinTech has revolutionized the financial sector globally, and Saudi Arabia is no exception. The use of cutting-edge technology like machine learning, AI, and blockchain has significantly contributed to reducing financial fraud in the country. As more business is conducted online, the risk of financial crime increases, requiring more advanced techniques to prevent fraud. FinTech has stepped up to the challenge by providing new approaches to the issue. The digitization of banking through FinTech has provided amenities to clients while reducing costs. This, in turn, has encouraged online transactions, raising the need for robust fraud protection measures.

FinTech has made formerly unavailable fraud protection procedures highly effective through machine learning, AI, and blockchain. These technologies analyze vast amounts of data and detect anomalies in real time, making it easier to prevent fraud.

In conclusion, FinTech has revolutionized the financial sector and proved instrumental in preventing financial fraud. The use of advanced technologies like machine learning, AI, and blockchain has made fraud protection measures more effective, safeguarding the banking system's integrity.

5. CONCLUSION AND DISCUSSION

The study shows that FinTech has the potential to enhance the sustainability of the financial system and reduce financial fraud. Advanced security features, efficient payment systems, transparency, and environmental sustainability are some key elements that can contribute to the success of FinTech solutions. Regulatory organizations and financial service providers should work together to create a robust legal and regulatory framework that promotes FinTech sustainability while deterring financial fraud. Moreover, consumers should be educated on FinTech sustainability and fraud prevention to ensure their participation in the financial system. Based on our study, we concluded that increased collaboration and investment in FinTech solutions could help to propel Saudi Arabia's technological and economic advancement.

Saudi Arabia has immensely contributed to the FinTech industry in recent years. With a growing entrepreneurial surrounding, a supportive regulatory framework, and a young population increasingly adopting new technologies, the country's FinTech market is poised for significant growth. However, the country must address challenges like cybersecurity, regulatory compliance, and financial literacy to realize its full potential.

One of the significant challenges facing Saudi Arabia's FinTech industry is cybersecurity. Cybersecurity is critical as FinTech solutions increasingly rely on mobile and online channels to deliver financial services. The Financial Sector Cybersecurity Framework (FSCF) is a regulatory initiative that addresses cybersecurity risks and strengthens the security posture of institutions that operate in the financial sector. Here, the Central Bank of Saudi Arabia (SAMA) has played a leading role in driving the adoption of cybersecurity practices in the country's financial sector. SAMA has recently announced a new digital banking strategy to enhance financial inclusion and promote the growth of FinTech.

ISSN 1533-9211

DOI: 10.5281/zenodo.10071194

Another challenge in Saudi Arabia's FinTech industry is regulatory compliance. Although the regulatory framework is in place, there is a need for more detailed guidance on regulatory compliance for FinTech businesses. Regulatory compliance ensures that FinTech businesses operate within the boundaries of the law while protecting customers' interests. To address this issue, regulatory organizations should provide more guidance and support to FinTech businesses to promote their sustainability and regulatory compliance.

Finally, consumers need to be aware of the importance of FinTech sustainability and fraud prevention. Financial literacy is essential as consumers become more involved in digital financial services. Educating consumers can help to build trust and confidence in FinTech solutions while deterring financial fraud. The government and financial institutions should develop educational programs to raise consumer awareness of FinTech solutions.

In conclusion, the study highlights the potential of FinTech to improve the financial system's sustainability and deter financial fraud. Advancements in technology and regulatory frameworks have made FinTech a powerful tool for transforming the financial system. Saudi Arabia's young population, supportive regulatory framework, and expanding entrepreneurial sector position the country to become a leader in FinTech. However, cybersecurity, regulatory compliance, and financial literacy remain significant challenges that must be addressed to ensure the sustainability of the FinTech industry. By collaborating and investing in FinTech solutions, Saudi Arabia can take advantage of FinTech's opportunities to drive economic growth and technological advancement.

References

1) Abdulla, I., Khaled, L., Mohd, K., Hamdan, A., & Akeel, H. (2023) Impact of FinTech on the Sustainable Development of Bahrain During Covid-19 Pandemic. In*: Vol. 620 LNNS* (pp. 193-202): Springer Science and Business Media Deutschland GmbH.

2) Abu Daqar, M. A. M., Arqawi, S., & Karsh, S. A. (2020). Fintech in the eyes of Millennials and Generation Z (the financial behavior and Fintech perception). *Banks and Bank Systems, 15*(3), 20-28. doi:10.21511/bbs.15(3).2020.03

3) Alam, M. M., Awawdeh, A. E., & Muhamad, A. I. B. (2021). Using e-wallet for business process development: challenges and prospects in Malaysia. *Business Process Management Journal, 27*(4), 1142-1162. doi:10.1108/BPMJ-11-2020-0528

4) Ali, S., Simboh, B., & Rahmawati, U. (2023). Determining Factors of Peer-to-Peer (P2P) Lending Avoidance: Empirical Evidence from Indonesia. *Gadjah Mada International Journal of Business, 25*(1), 1-27. doi:10.22146/gamaijb.68805

5) Arner, D. W., Zetzsche, D. A., Buckley, R. P., & Barberis, J. N. (2019). The Identity Challenge in Finance: From Analogue Identity to Digitized Identification to Digital KYC Utilities. *European Business Organization Law Review, 20*(1), 55-80. doi:10.1007/s40804-019-00135-1

6) Asif, M., Khan, M. N., Tiwari, S., Wani, S. K., & Alam, F. (2023). The Impact of Fintech and Digital Financial Services on Financial Inclusion in India. *Journal of Risk and Financial Management, 16*(2). doi:10.3390/jrfm16020122

7) Asmarani, S. C., & Wijaya, C. (2020). Effects of fintech on stock return: Evidence from retail banks listed in Indonesia stock exchange. *Journal of Asian Finance, Economics and Business, 7*(7), 95-104.

ISSN 1533-9211
DOI: 10.5281/zenodo.10071194

doi:10.13106/jafeb.2020.vol7.no7.095

8) Awais, M., Afzal, A., Firdousi, S., & Hasnaoui, A. (2023). Is fintech the new path to sustainable resource utilisation and economic development? *Resources Policy, 81*. doi:10.1016/j.resourpol.2023.103309

9) Bakri, M. H., Almansoori, K. K. S. M., & Azlan, N. S. M. (2023). Determinants intention usage of Islamic E-Wallet Among Millennials. *Global Business and Finance Review, 28*(1), 11-32. doi:10.17549/gbfr.2023.28.1.11

10) Banna, H., & Alam, M. R. (2021). Impact of digital financial inclusion on ASEAN banking stability: implications for the post-Covid-19 era. *Studies in Economics and Finance, 38*(2), 504-523. doi:10.1108/SEF-09-2020-0388

11) Belozyorov, S., Sokolovska, O., & Kim, Y. S. (2020). Fintech as a precondition for transformations on global financial markets. *Foresight and STI Governance, 14*(2), 23-35. doi:10.17323/2500-2597.2020.2.23.35

12) Bhat, J. R., AlQahtani, S. A., & Nekovee, M. (2023). FinTech enablers, use cases, and role of future internet of things. *Journal of King Saud University - Computer and Information Sciences, 35*(1), 87-101. doi:10.1016/j.jksuci.2022.08.033

13) Boot, A., Hoffmann, P., Laeven, L., & Ratnovski, L. (2021). Fintech: what's old, what's new? *Journal of Financial Stability, 53*. doi:10.1016/j.jfs.2020.100836

14) Botchey, F. E., Qin, Z., & Hughes-Lartey, K. (2020). Mobile money fraud prediction-A cross-case analysis on the efficiency of support vector machines, gradient boosted decision trees, and Naïve Bayes algorithms. *Information (Switzerland), 11*(8). doi:10.3390/INFO11080383

15) Bozkuş Kahyaoğlu, S. (2022) Introduction. In. *Accounting, Finance, Sustainability, Governance and Fraud* (pp. 3-12): Springer.

16) Charaia, V., Chochia, A., & Lashkhi, M. (2021). Promoting fintech financing for SME in S. Caucasian and baltic states, during the COVID-19 global pandemic. *Business, Management and Economics Engineering, 19*(2), 358-372. doi:10.3846/bmee.2021.14755

17) Chen, D., Deakin, S., Johnston, A., & Wang, B. (2021). Too Much Technology and Too Little Regulation? The Spectacular Demise of P2P Lending in China. *Accounting, Economics and Law: A Convivium*. doi:10.1515/ael-2021-0056

18) Chinoda, T., & Mashamba, T. (2021). Fintech, financial inclusion and income inequality nexus in Africa. *Cogent Economics and Finance, 9*(1). doi:10.1080/23322039.2021.1986926

19) Chung, S., Kim, K., Lee, C. H., & Oh, W. (2023). Interdependence between online peer-to-peer lending and cryptocurrency markets and its effects on financial inclusion. *Production and Operations Management*. doi:10.1111/poms.13950

20) Currie, W. L., Gozman, D. P., & Seddon, J. J. M. (2018). Dialectic tensions in the financial markets: a longitudinal study of pre- and post-crisis regulatory technology. *Journal of Information Technology, 33*(4), 304-325. doi:10.1057/s41265-017-0047-5

21) de Jesús González, J., Valdés Medina, F. E., & Saavedra García, M. L. (2021). Success Factors in Financing for Smes through Crowdfunding in Mexico. *Revista Mexicana de Economia y Finanzas Nueva Epoca, 16*(2). doi:10.21919/remef.v16i2.471

22) Dehghani, M. A., Karavidas, D., Panourgias, N., Hutchinson, M., & Reilly, P. O. (2023). Assessing the Quality of Financial Technology Patents Through the Development of a Patent Quality Index for Comparing Jurisdictions, Technical Domains, and Leading Organizations. *IEEE Transactions on Engineering Management*, 1-17. doi:10.1109/TEM.2023.3240620

The Seybold Report
ISSN 1533-9211
DOI: 10.5281/zenodo.10071194

23) Dhali, M., Hassan, S., Mehar, S. M., Shahzad, K., & Zaman, F. (2023). Cryptocurrency in the Darknet: sustainability of the current national legislation. *International Journal of Law and Management, 65*(3), 261-282. doi:10.1108/IJLMA-09-2022-0206

24) Dudin, M. N., & Shkodinsky, S. V. (2022). Challenges and threats of the digital economy to the Sustainability of the National Banking System. *Finance: Theory and Practice, 26*(6), 52-71. doi:10.26794/2587-5671-2022-26-6-52-71

25) Esmat, A., de Vos, M., Ghiassi-Farrokhfal, Y., Palensky, P., & Epema, D. (2021). A novel decentralized platform for peer-to-peer energy trading market with blockchain technology. *Applied Energy, 282*. doi:10.1016/j.apenergy.2020.116123

26) Felipe, I. J. D. S., Mendes-Da-Silva, W., Leal, C. C., & Braun Santos, D. (2022). Reward crowdfunding campaigns: Time-to-success analysis. *Journal of Business Research, 138*, 214-228. doi:10.1016/j.jbusres.2021.09.004

27) Ferreira, F., & Pereira, L. (2018). *Success Factors in a Reward and Equity Based Crowdfunding Campaign*.

28) Griffin, J. M., Kruger, S., & Mahajan, P. (2023). Did FinTech Lenders Facilitate PPP Fraud? *Journal of Finance, 78*(3), 1777-1827. doi:10.1111/jofi.13209

29) Guang-Wen, Z., & Siddik, A. B. (2023). The effect of Fintech adoption on green finance and environmental performance of banking institutions during the COVID-19 pandemic: the role of green innovation. *Environmental Science and Pollution Research, 30*(10), 25959-25971. doi:10.1007/s11356-022-23956-z

30) Hua, X., & Huang, Y. (2021). Understanding China's fintech sector: development, impacts and risks. *European Journal of Finance, 27*(4-5), 321-333. doi:10.1080/1351847X.2020.1811131

31) Iddrisu, K., Abor, J. Y., & Banyen, K. T. (2022). Fintech, foreign bank presence and inclusive finance in Africa: Using a quantile regression approach. *Cogent Economics and Finance, 10*(1). doi:10.1080/23322039.2022.2157120

32) Khilfah, H. N. L., & Faturohman, T. (2020). Social Media Data To Determine Loan Default Predicting Method In An Islamic Online P2p Lending. *Journal of Islamic Monetary Economics and Finance, 6*(2), 243-274. doi:10.21098/jimf.v6i2.1184

33) Łasak, P. (2022). The role of financial technology and entrepreneurial finance practices in funding small and medium-sized enterprises. *Journal of Entrepreneurship, Management and Innovation, 18*(1), 7-34. doi:10.7341/20221811

34) Le, L. T. N., Yarovaya, L., & Nasir, M. A. (2021). Did COVID-19 change spillover patterns between Fintech and other asset classes? *Research in International Business and Finance, 58*. doi:10.1016/j.ribaf.2021.101441

35) Le, T. N. L., Abakah, E. J. A., & Tiwari, A. K. (2021). Time and frequency domain connectedness and spill-over among fintech, green bonds and cryptocurrencies in the age of the fourth industrial revolution. *Technological Forecasting and Social Change, 162*. doi:10.1016/j.techfore.2020.120382

36) Lebichot, B., Paldino, G. M., Siblini, W., He-Guelton, L., Oblé, F., & Bontempi, G. (2021). Incremental learning strategies for credit cards fraud detection. *International Journal of Data Science and Analytics, 12*(2), 165-174. doi:10.1007/s41060-021-00258-0

37) Lee, J., Li, T., & Shin, D. (2022). The Wisdom of Crowds in FinTech: Evidence from Initial Coin Offerings. *Review of Corporate Finance Studies, 11*(1), 1-46. doi:10.1093/rcfs/cfab014

38) Lisha, L., Mousa, S., Arnone, G., Muda, I., Huerta-Soto, R., & Shiming, Z. (2023). Natural resources, green innovation, fintech, and sustainability: A fresh insight from BRICS. *Resources Policy, 80*. doi:10.1016/j.resourpol.2022.103119

ISSN 1533-9211
DOI: 10.5281/zenodo.10071194

39) Lorenzo, L., & Arroyo, J. (2022). Analysis of the cryptocurrency market using different prototype-based clustering techniques. *Financial Innovation, 8*(1). doi:10.1186/s40854-021-00310-9

40) Mangini, E. R., da Silva, N. G., & de Carvalho, J. R. C. (2021). Virtual banks and the perceived risk and development and effort expectancy on behavioral intention. *Revista Brasileira de Marketing, 19*(4), 838-861. doi:10.5585/REMARK.V19I4.16283

41) Mapanje, O., Karuaihe, S., Machethe, C., & Amis, M. (2023). Financing Sustainable Agriculture in Sub-Saharan Africa: A Review of the Role of Financial Technologies. *Sustainability (Switzerland), 15*(5). doi:10.3390/su15054587

42) Mariani, F., Polinesi, G., & Recchioni, M. C. (2022). A tail-revisited Markowitz mean-variance approach and a portfolio network centrality. *Computational Management Science, 19*(3), 425-455. doi:10.1007/s10287-022-00422-2

43) Mauladi, K. F., Jaya, I. M. L. M., & Esquivias, M. A. (2022). Exploring the Link between Cashless Society and Cybercrime in Indonesia. *Journal of Telecommunications and the Digital Economy, 10*(3), 58-76. doi:10.18080/jtde.v10n3.533

44) Mavlutova, I., Volkova, T., Spilbergs, A., Natrins, A., Arefjevs, I., & Verdenhofs, A. (2021). The role of fintech firms in contemporary financial sector development. *WSEAS Transactions on Business and Economics, 18*, 411-423. doi:10.37394/23207.2021.18.42

45) Mhlanga, D. (2020). Industry 4.0 in finance: the impact of artificial intelligence (ai) on digital financial inclusion. *International Journal of Financial Studies, 8*(3), 1-14. doi:10.3390/ijfs8030045

46) Mirza, N., Umar, M., Afzal, A., & Firdousi, S. F. (2023). The role of fintech in promoting green finance, and profitability: Evidence from the banking sector in the euro zone. *Economic Analysis and Policy, 78*, 33-40. doi:10.1016/j.eap.2023.02.001

47) Moccia, S., García, M. R., & Tomic, I. (2021). Fintech strategy: E-reputation. *International Journal of Intellectual Property Management, 11*(1), 38-53. doi:10.1504/ijipm.2021.113367

48) Mosteanu, N. R., & Faccia, A. (2021). Fintech frontiers in quantum computing, fractals, and blockchain distributed ledger: Paradigm shifts and open innovation. *Journal of Open Innovation: Technology, Market, and Complexity, 7*(1), 1-19. doi:10.3390/joitmc7010019

49) Muganyi, T., Yan, L., Yin, Y., Sun, H., Gong, X., & Taghizadeh-Hesary, F. (2022). Fintech, regtech, and financial development: evidence from China. *Financial Innovation, 8*(1). doi:10.1186/s40854-021-00313-6

50) Noreen, M., Mia, M. S., Ghazali, Z., & Ahmed, F. (2022). Role of Government Policies to Fintech Adoption and Financial Inclusion: A Study in Pakistan. *Universal Journal of Accounting and Finance, 10*(1), 37-46. doi:10.13189/ujaf.2022.100105

51) Okoli, T. T. (2020). Is the relationship between financial technology and credit risk monotonic? evidence from the brics economies. *Asian Economic and Financial Review, 10*(9), 999-1011. doi:10.18488/journal.aefr.2020.109.999.1011

52) Omodero, C. O. (2021). Fintech Innovation in the Financial Sector: Influence of E-Money Products on a Growing Economy. *Studia Universitatis Vasile Goldis Arad, Economics Series, 31*(4), 40-53. doi:10.2478/sues-2021-0018

53) Ozili, P. K. (2018). Impact of digital finance on financial inclusion and stability. *Borsa Istanbul Review, 18*(4), 329-340. doi:10.1016/j.bir.2017.12.003

54) Ozili, P. K. (2020). Contesting digital finance for the poor. *Digital Policy, Regulation and Governance, 22*(2), 135-151. doi:10.1108/DPRG-12-2019-0104

ISSN 1533-9211
DOI: 10.5281/zenodo.10071194

55) Ozili, P. K. (2021). Financial inclusion research around the world: A review. *Forum for Social Economics, 50*(4), 457-479. doi:10.1080/07360932.2020.1715238

56) Pang, G., Li, J., Van Den Hengel, A., Cao, L., & Dietterich, T. G. (2021). *Anomaly and Novelty Detection, Explanation, and Accommodation (ANDEA)*.

57) Pang, G., Li, J., Van Den Hengel, A., Cao, L., & Dietterich, T. G. (2022). *ANDEA: Anomaly and Novelty Detection, Explanation, and Accommodation*.

58) Panos, G. A., & Wilson, J. O. S. (2020). Financial literacy and responsible finance in the FinTech era: capabilities and challenges. *European Journal of Finance, 26*(4-5), 297-301. doi:10.1080/1351847X.2020.1717569

59) Pompella, M., & Costantino, L. (2021). Financial innovation and technology after COVID-19 a few directions for policy makers and regulators in the view of old and new disruptors. *Ekonomika, 100*(2), 40-62. doi:10.15388/EKON.2021.100.2.2

60) Razak, M. I. A., Dali, N. A. M., Dhillon, G., & Manaf, A. W. A. (2021). Fintech in Malaysia: An appraisal to the need of shariah-compliant regulation. *Pertanika Journal of Social Sciences and Humanities, 28*(4), 3223-3233. doi:10.47836/PJSSH.28.4.40

61) Saka, O., Eichengreen, B., & Aksoy, C. G. (2022). Epidemic Exposure, Financial Technology, and the Digital Divide. *Journal of Money, Credit and Banking, 54*(7), 1913-1940. doi:10.1111/jmcb.12945

62) Sapulette, M. S., Effendi, N., & Santoso, T. (2021). Fintech, Banks, And The Covid-19 Pandemic: Evidence From Indonesia. *Buletin Ekonomi Moneter dan Perbankan, 24*(4), 559-588. doi:10.21098/BEMP.V24I4.1470

63) Shrestha, K., Naysary, B., & Philip, S. S. S. (2023). Fintech market efficiency: A multifractal detrended fluctuation analysis. *Finance Research Letters, 54*. doi:10.1016/j.frl.2023.103775

64) Siddik, A. B., Yong, L., & Rahman, M. N. (2023). The role of Fintech in circular economy practices to improve sustainability performance: a two-staged SEM-ANN approach. *Environmental Science and Pollution Research*. doi:10.1007/s11356-023-25576-7

65) Stojanović, B., & Božić, J. (2022). Robust Financial Fraud Alerting System Based in the Cloud Environment. *Sensors, 22*(23). doi:10.3390/s22239461

66) Suryanto, S., Muhyi, H. A., Kurniati, P. S., & Mustapha, N. (2022). Banking Financial Performance In The Industry Financial Technology Era. *Journal of Eastern European and Central Asian Research, 9*(5), 889-900. doi:10.15549/jeecar.v9i5.1075

67) Teichmann, F. M. J., Boticiu, S. R., & Sergi, B. S. (2023). Compliance concerns in sustainable finance: an analysis of peer-to-peer (P2P) lending platforms and sustainability. *Journal of Financial Crime*. doi:10.1108/JFC-11-2022-0281

68) Tepe, G., Geyikci, U. B., & Sancak, F. M. (2022). FinTech Companies: A Bibliometric Analysis. *International Journal of Financial Studies, 10*(1). doi:10.3390/ijfs10010002

69) Thompson, B. S., & Rust, S. (2023). Blocking blockchain: Examining the social, cultural, and institutional factors causing innovation resistance to digital technology in seafood supply chains. *Technology in Society, 73*. doi:10.1016/j.techsoc.2023.102235

70) Wang, H. (2018). *Detection of fraudulent users in P2P financial market*.

71) Widagdo, B., & Sa'diyah, C. (2023). Business sustainability: Functions of financial behavior, technology, and knowledge. *Problems and Perspectives in Management, 21*(1), 120-130. doi:10.21511/ppm.21(1).2023.11

ISSN 1533-9211

DOI: 10.5281/zenodo.10071194

72) Wijaya, L. I., Zunairoh, Z., Rianawati, A., Prasetyo, V. R., & Harianto, I. (2022). Does Financial Technology Matter? Evidence from the Indonesia Healthcare Industry during the Covid-19 Pandemic. *Scientific Papers of the University of Pardubice, Series D: Faculty of Economics and Administration, 30*(1). doi:10.46585/sp30011509

73) Yang, Y., Chen, R., Bai, X., & Chen, D. (2020). *Finance fraud detection with neural network*.

74) Yeow, A., Lee Kuo Chuen, D., Tan, R., & Chia, M. (2018). Indonesian Microfinance Institutions (MFI) Move to Technology-TBOP's Prodigy Experience. In *Handbook of Blockchain, Digital Finance, and Inclusion* (Vol. 2, pp. 431-449): Elsevier Inc.

75) Yi, T. Z., Rom, N. A. M., Hassan, N. M., Samsurijan, M. S., & Ebekozien, A. (2023). The Adoption of Robo-Advisory among Millennials in the 21st Century: Trust, Usability and Knowledge Perception. *Sustainability (Switzerland), 15*(7). doi:10.3390/su15076016

76) Yoon, C., & Lim, D. (2020). An empirical study on factors affecting customers' acceptance of internet-only banks in Korea. *Cogent Business and Management, 7*(1). doi:10.1080/23311975.2020.1792259

77) Zalewska, A. (2023). Bankers' remuneration reforms and new challenges. *Corporate Governance: An International Review, 31*(1), 161-177. doi:10.1111/corg.12454

78) Zhao, X., Hou, W., An, J., Liu, X., & Zhang, Y. (2021). Initial Coin offerings: what rights do investors have? *European Journal of Finance, 27*(4-5), 305-320. doi:10.1080/1351847X.2020.1858130