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From the Editorial Committee

We are giving you the next Vol. 29, No. 4(2024) issue of the Quarterly of the Faculty of Management of the Rzeszow University of Technology entitled “Modern Management Review”.

The primary objective of the Quarterly is to promote publishing of the results of scientific research within economic and social issues in economics, law, finance, management, marketing, logistics, as well as politics, corporate history and social sciences.

Our aim is also to raise the merits and the international position of the Quarterly published by our Faculty. That is why we provided foreign Scientific Council, as well as an international team of Reviewers to increase the value of the scientific publications.

The works placed in this issue include many assumptions and decisions, theoretical solutions as well as research results, analyses, comparisons and reflections of the Authors.

We would like to thank all those who contributed to the issue of the Quarterly and we hope that you will enjoy reading this issue.

With compliments
Editorial Committee

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EXPLORING THE CORRELATION BETWEEN CORPORATE SOCIAL RESPONSIBILITY INDICATORS AND CORPORATE REPUTATION: CASE STUDY OF LEGO GROUP 2012–2023

This study examines the correlation between Corporate Social Responsibility (CSR) indicators and LEGO Group's corporate reputation from 2012 to 2023. Using quantitative analysis, the research investigates the relationship between key CSR metrics, such as environmental, employee, and customer-focused initiatives, and their impact on LEGO's reputation ranking as measured by the RepTrak platform. The findings reveal a strong positive correlation between waste management efforts, particularly waste to landfill, and corporate reputation, while water consumption and injury rates show strong negative and positive correlations, respectively. Other indicators, including carbon emissions, community engagement, and employee satisfaction, show weaker correlations. The study underscores the importance of environmental management and workplace safety in enhancing corporate reputation while highlighting areas where CSR practices contribute less significantly to reputation. These insights contribute to understanding how CSR practices shape public perception and business success over time.

Keywords: corporate social responsibility, corporate social responsibility indicators, corporate reputation, LEGO Group.

1. INTRODUCTION

In the modern corporate world, Corporate Social Responsibility (CSR) has evolved from a supplementary concern to a central tenet of corporate strategy. This shift reflects the changing expectations of stakeholders, including customers, investors, employees, and government who increasingly demand that companies balance profit-making with positive societal impact. As organizations navigate this complex environment, the relationship

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between CSR practices and corporate reputation has become a subject of significant interest for both professionals and academics.

The concept of CSR includes a wide range of activities through which companies integrate social, environmental, and economic concerns into their business operations and interactions with stakeholders. These activities can cover sustainable environmental practices, ethical labor policies, community engagement, and transparent governance structures. As companies invest more resources into CSR, there is a rising need to understand how these efforts translate into reputational gains and, by extension, long-term business success.

This study centers on the LEGO Group, a company renowned for its commitment to CSR and reputation, as a case study to explore the relationship between CSR indicators and corporate reputation. LEGO's long-standing emphasis on sustainability, ethical practices, and social responsibility makes it an ideal subject for examining how CSR initiatives can shape public perception and brand value over time.

Study Objectives

The main objective of this study is to examine the correlation between quantitative CSR indicators and corporate reputation, using the LEGO Group as a case study over the period from 2012 to 2023. Specifically, this research aims to:

- Identify and analyze key quantitative CSR indicators relevant to the LEGO Group's operations using sustainability reports.
- Examine the relationship between these CSR indicators and LEGO's reputation as measured by the RepTrak platform.
- Assess the potential impact of specific CSR practices on LEGO's reputational scores over time.

Study Methodology

This study investigates the correlation between Corporate Social Responsibility (CSR) indicators and corporate reputation, using the LEGO Group as a case study from 2012 to 2023. It examines how LEGO's CSR initiatives, such as sustainability, ethical labor practices, and community engagement, influence its reputation, measured through the RepTrak platform. Employing quantitative methods, the research collects CSR data from LEGO's sustainability reports and correlates it with reputational score and ranking to identify key drivers of public perception. Using Pearson Correlation model, the study assesses the interrelation between CSR indicators and Corporate Reputation at LEGO Group, providing insights into the strategic importance of CSR in shaping corporate reputation.

2. LITERATURE REVIEW OF CORPORATE SOCIAL RESPONSIBILITY AND REPUTATION

Corporate social responsibility (CSR) has developed over the years, forming how corporations interact with community and manage their responsibilities beyond profit generation. Corporations, as key economic players, are increasingly expected to integrate their operations with ethical, social, and environmental concerns. Understanding the dynamic relationship between CSR and corporations is necessary to exploring their broader impact on stakeholders and sustainability.

2.1. Corporate Social Responsibility Concept Evolution

Corporate Social Responsibility (CSR) has been a concept of evolving significance in the business world, marked by various interpretations and definitions that mirror the changing expectations of society over time. One of the earliest discussions of CSR can be traced back to Bowen (1953), who suggested that corporations should stick to specific principles to fulfill their social responsibilities, emphasizing that the decisions and actions of business leaders affect stakeholders, employees, and customers, and thus directly impact society's quality of life. Building on this foundation, Johnson (1957), president of New York’s Institute of Life Insurance, further emphasized that corporations were increasingly recognizing their “new role of corporate citizenship”, where they acknowledged their social and economic responsibilities to the whole community. Together, these early perspectives highlight the evolving view that businesses must go beyond profit-making and actively contribute to the well-being of society as a whole.

As the mid-20th century progressed, scholars began to explore CSR in detail. Eells (1956) critiqued the corporate behavior of the time, emphasizing that large corporations were not fulfilling their responsibilities, especially in the context of generalized inflation. Selekman (1959) further examined the moral responsibilities of corporations, particularly in response to the labor expectations of the era. These early contributions highlighted the growing concern over corporate accountability and the ethical obligations of businesses to society.

During the 1960s, the concept of CSR continued to gain traction as scholars like Davis (1960) recognized the pressures on business leaders to re-examine their role in society. Davis argued that notable social, economic, and political changes necessitated a reassessment of social responsibility, linking it to economic returns for firms. He claimed that the social responsibilities of business leaders should be consistent with their social power, warning that neglecting these responsibilities could lead to a loss of social influence.

Frederick (1960) also contributed to the discourse by proposing a theory of business responsibility that emphasized the need for deliberate and conscious efforts to achieve responsible corporate behavior. McGuire (1963) expanded on this by suggesting that a firm’s responsibilities extend beyond legal and economic obligations, including concerns for politics, social welfare, and employee well-being. Walton (1967) suggested that corporations should be viewed as potential contributors to improving societal and economic conditions, reinforcing the idea that CSR involves a relationship between corporations and society.

By the 1970s, the concept of CSR had further evolved, with Davis (1970) emphasizing that firms should consider and respond to issues beyond economic, technical, and legal requirements to achieve social benefits alongside traditional economic gains. Steiner (1971) reflected this view, stating that businesses have social responsibilities to help society achieve its basic goals, thus reinforcing the role of CSR in aligning corporate actions with societal needs.

Carroll (1979) provided a comprehensive framework by defining CSR as integrated economic, legal, ethical, and discretionary expectations that society has of organizations at a given time. This broader view highlighted the multifaceted nature of CSR, integrating various dimensions of responsibility that businesses must consider in their operations.

In more recent years, Montiel (2008) discussed the ethical obligation of businesses to evaluate the effects of their decisions on the entire social system, linking CSR to corporate sustainability. Sheehy (2014) conceptualized CSR as a set of strategic initiatives undertaken by businesses to evaluate and assume responsibility for their environmental and social impact. This contemporary view underscores the relevance of CSR in today's corporate world, emphasizing its role in enhancing both theoretical discussions and practical applications.

Adding to this discourse, Licandro et al. (2023) proposed a modern definition of CSR as a management philosophy focused on the responsible management of a company's externalities, benefiting stakeholders, society, and the environment. A recent study by Fatima and Elbanna (2023) defines CSR as a business approach that contributes to sustainable development by integrating economic, social, and environmental benefits for all stakeholders into corporate strategies. This integration not only enhances corporate reputation but also attracts and retains talent, fostering long-term business sustainability by addressing necessary social and environmental challenges. Similarly, Goyal and Routroy (2021) emphasize the importance of sustainable practices in achieving broader corporate and societal goals, while Fellag (2016) conceptualized CSR as the deliberate contributions of business organizations toward fulfilling the requirements of strategic partnership responsibility in integrated socio-economic development, grounded in their relationship with society.

During its development, CSR has been recognized as a critical aspect of corporate behavior, progressing from a set of ethical principles to a comprehensive management philosophy that balances economic performance with societal and environmental responsibilities. This chronological exploration of CSR highlights the growing importance of corporate accountability and the ongoing integration of social and environmental considerations into business practices.

2.2. Corporate Reputation Background

Corporate reputation is a complex and multifaceted concept that has been interpreted and defined in various ways across academic literature. Fombrun and Shanley (1990) describe it as the comprehensive estimation in which a company is held by its stakeholders, emphasizing the significance of external perceptions from customers, investors, and the general public. The same view is reinforced by Barnett, Jermier, and Lafferty (2006), who expand on this definition by considering corporate reputation as a collective representation of a company's past actions and outcomes, which can evoke either favorable or unfavorable responses from stakeholders. Both perspectives highlight the significant role of stakeholders' perceptions in shaping corporate reputation.

Adding to this, Walker (2010) provides a more comprehensive definition by incorporating elements of perception, valuation, and comparison. He defines corporate reputation as a collective judgment of a company's ability to create value based on its characteristics, such as identity and actions, in comparison to its competitors. This broader view includes both tangible and intangible assets, emphasizing their contribution to a company's reputation. The dynamic nature of corporate reputation is further underscored by Wartick (2002), who views it as an evolving process influenced by ongoing corporate behavior and interactions with stakeholders, aligning with the idea that reputation reflects not only past actions but also future performance.

Moreover, consistency in corporate actions is considered fundamental for building and maintaining a positive reputation. Gotsi and Wilson (2001) argue that corporate reputation is the outcome of consistent behavior over time, which stakeholders perceive as reliable and trustworthy. Deephouse and Carter (2005) add that corporate reputation serves as an intangible asset that provides a competitive advantage by differentiating a company from its peers, leading to enhanced financial performance and market share. These perspectives collectively suggest that corporate reputation is not only about past behavior but also serves as a predictor of future performance.

The diversity of concepts related to corporate reputation indicates a lack of a universally accepted definition, which presents challenges in measuring the construct. Pires and Trez (2018) highlight this challenge, noting that the intangible nature of corporate reputation makes it difficult to measure, yet it remains a crucial element of a company's competitive strategy. In this context, reputation is viewed as a valuable asset that influences a company's appeal to stakeholders (Fombrun, Van Riel, 1996; Fombrun, Rindova, 2001; Walker, 2010).

Furthermore, corporate reputation is seen as an intangible asset with financial value, as discussed in accountancy, economics, marketing, organizational behavior, sociology, and strategy. Each discipline views reputation through its unique lens, whether as a financial asset, a trait or signal, or an aggregate assessment of a firm's performance relative to expectations and norms (Fombrun, van Riel, 1996). Chun (2005) provides a comprehensive view by defining corporate reputation as the perceptions held by all relevant stakeholders about an organization, including customers, employees, suppliers, and communities. This summary perspective suggests that reputation includes both perception and reality, with perception relating to stakeholders' views and reality to the organization's policies, practices, and performance (Deephouse, Carter, 2005; Bromley, 2000).

In conclusion, while definitions of corporate reputation vary, there is a consensus that it is a perception-based construct that reflects stakeholders' evaluations of a company's actions and their outcomes over time. The literature underscores the importance of corporate reputation as a key intangible asset that can significantly impact a company's competitive position in the market. Thus, the ongoing interest in corporate reputation from both academic and practical perspectives continues to form its role in corporate strategy and performance.

2.3. Relationship between CSR and Corporate Reputation

The relationship between Corporate Social Responsibility (CSR) and corporate reputation has been a significant focus in academic literature, with various theoretical perspectives offering insights into how CSR activities influence a company's reputation. To begin with, Stakeholder Theory suggests that companies are accountable not only to shareholders but also to a broad range of stakeholders, and by engaging in CSR, they can improve their reputation by addressing the concerns of these groups (Freeman, 1984; Clarkson, 1995). Moreover, the Resource-Based View (RBV) frames CSR as a strategic resource that contributes to a company's competitive advantage, mainly by viewing corporate reputation as an intangible asset that differentiates a company in the marketplace (Barney, 1991; Fombrun, Shanley, 1990). Similarly, Legitimacy Theory posits that CSR is a means for companies to align their actions with societal norms and expectations, thereby achieving and maintaining legitimacy (Suchman, 1995). In addition, Institutional Theory emphasizes that CSR practices are often a response to institutional pressures, and by conforming to these norms, companies can enhance their reputation (DiMaggio, Powell, 1983). Lastly, Signaling Theory explains that CSR activities serve as signals to stakeholders, thereby reducing information imbalance and building trust, which in turn strengthens corporate reputation (Spence, 1973).

Emerging perspectives further deepen the understanding of the CSR-corporate reputation relationship. For instance, Shared Value Creation redefines the connection between CSR and reputation by integrating social and economic goals, suggesting that companies that align their business models with social value creation can achieve sustainable competitive advantages (Porter, Kramer, 2011). Additionally, Dynamic Capabilities Theory highlights that CSR enhances a company's adaptability and innovation, thereby contributing to a resilient organizational identity and a stronger reputation (Teece, 2007). Moreover, the increasing demand for Authenticity and Transparency in CSR activities underscores that real and transparent initiatives are more likely to provide positive reputational benefits (Molleda, Jain, 2013). In this context, Social Identity Theory introduces a psychological perspective, suggesting that CSR activities aligned with stakeholders' values foster strong identification with the company, which in turn leads to an enhanced reputation (Bhattacharya, Sen, 2004). Furthermore, the role of Digital Media in CSR communication is also crucial, as it facilitates interactive engagement and widespread dissemination of CSR efforts, thereby significantly impacting corporate reputation (Etter, 2014).

Recent empirical studies have consistently supported these theoretical perspectives by demonstrating the positive influence of CSR on corporate reputation across different contexts. For instance, Zhang et al. (2023) found that various CSR factors significantly impact corporate reputation, which, in turn, influences financial performance. Similarly, Juniarti (2023) emphasized the mediating role of corporate reputation in the relationship between CSR and firm performance. Moreover, Ali et al. (2023) explored the mediating role of organic organizational cultures in the CSR-reputation relationship, discovering that these cultures fully mediate this relationship and positively influence employees' organizational citizenship behavior (OCB). Furthermore, in the context of emerging economies, Pradhan (2016) demonstrated that CSR intensity and social initiatives significantly enhance corporate reputation, a finding that aligns with Melero-Polo and López-Pérez (2017), who highlighted the impact of CSR on brand value and financial performance globally. Additionally, Berber et al. (2022) confirmed the positive relationship between CSR and reputation in the Serbian context, while Zhao et al. (2021) showed that consumer trust mediates the relationship between CSR, corporate reputation, and brand equity. Lastly, Božić et al. (2021) and Yan et al. (2022) further validated the positive impact of CSR on corporate reputation, particularly emphasizing the importance of internal factors such as employee trust and organizational justice.

Collectively, these studies emphasize the multifaceted role of CSR in shaping corporate reputation and highlight the importance of considering both internal and external factors when evaluating CSR's impact on business success.

3. CORPORATE SOCIAL RESPONSIBILITY INDICATORS AT LEGO GROUP 2012–2023

The LEGO Group, established in 1932 by Ole Kirk Kristiansen in Denmark, is a leading global manufacturer of toys, renowned for its iconic interlocking plastic bricks. Initially focused on producing wooden toys, the company introduced the first plastic LEGO bricks in 1949, which became the foundation for the brand's worldwide success. Over the ensuing decades, LEGO has expanded its product portfolio to encompass not only physical toys, but also digital experiences, theme parks, educational tools, and licensed collaborations with major entertainment franchises (LEGO_Group, 2024). Consistently committed to fostering creativity, learning, and innovation, the company has remained a family-owned business, guided by its philosophy to inspire and develop the builders of tomorrow. LEGO's steadfast dedication to sustainability and responsible business practices has also played a pivotal role in maintaining its global reputation and status as a market leader in the toy industry.

Key indicators of corporate social responsibility (CSR) cover various areas that can be quantitatively measured. Environmentally, these include energy consumption, water usage, greenhouse gas emissions, and waste management. For employees, key indicators are satisfaction, training hours, diversity, and safety. Customer-related measures include satisfaction, complaint resolution, product quality, and responsible marketing. In the community, metrics such as charitable contributions, volunteer hours, and stakeholder engagement are tracked. These quantifiable CSR metrics allow organizations to demonstrate their social responsibility and communicate their performance transparently.

3.1. Employee Indicators

Employee indicators in CSR evaluation assess a company's commitment to fair labor practices, including equitable compensation, diversity, training, professional development, and workplace safety. These metrics reflect the organization's ethical treatment of employees and its role in fostering a positive work environment.

3.1.1. Employees Motivation and Satisfaction

Measuring employee motivation and satisfaction as part of CSR commitment involves assessing factors such as job fulfillment, engagement, work-life balance, and organizational support. These metrics provide insights into how well a company meets employee expectations and contributes to a positive workplace culture. Table 1 provides the chronological progress of this metric in LEGO Group.

Table 1. Rate of Employees Satisfaction at LEGO Group (2018–2023)

	2018	2019	2020	2021	2022	2023
Satisfaction Score	76	79	82	83	83	80

Source: LEGO Group Sustainability Reports (2018–2023).

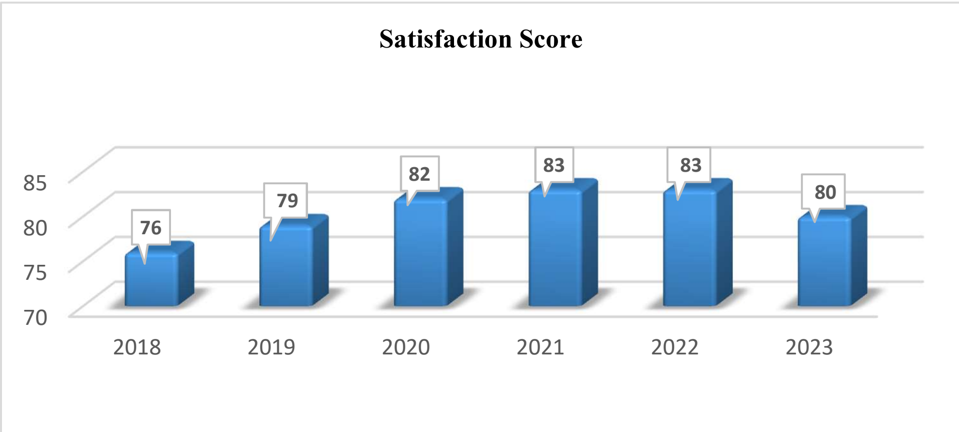

Figure 1. Employee Satisfaction Score at LEGO Group (2018–2023)

Source: LEGO Group Sustainability Reports (2018–2023).

Table 1 indicates a steady rise in employee satisfaction from 2018 to 2023. The satisfaction score steadily increased from 76 in 2018 to 83 in 2021, indicating consistent improvements in employee well-being and workplace conditions. However, in 2023, the score dropped slightly to 80, suggesting a potential need for the company to address emerging concerns or challenges in maintaining high levels of employee satisfaction. Nevertheless, the score remains good, reflecting overall positive employee sentiment.

3.1.2. Women Workforce

Women workforce representation is a key employee indicator, reflecting a company's commitment to gender diversity and inclusion. It assesses the proportion of women employed across various levels, from entry-level roles to leadership positions. This indicator highlights the organization's efforts in promoting equal opportunities, reducing gender disparities, and fostering an inclusive work environment, which contributes to overall social responsibility goals.

Table 2. LEGO Group Female Representation at Director Levels(2012–2023)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Rate of Females at Director Levels	34	37	43	43	44	41	43	36	38	40	41	41.5

Source: LEGO Group Sustainability Reports (2012–2023).

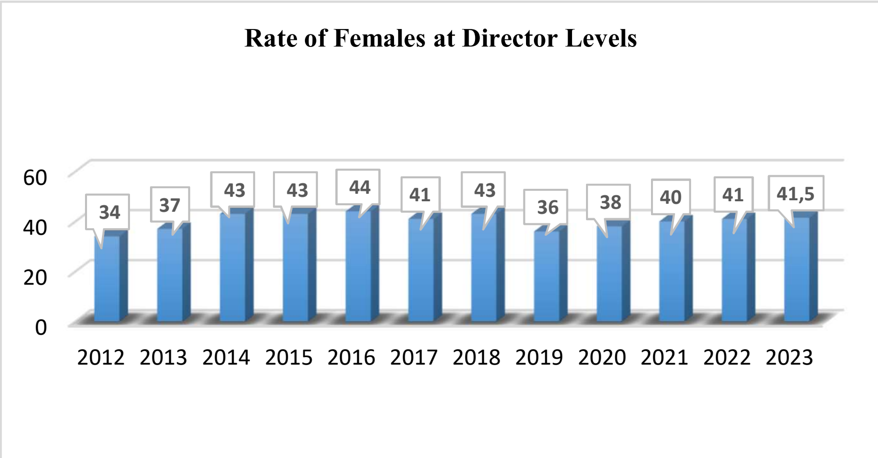

Figure 2. Female Representation at Director Levels in LEGO Group (2012–2023)

Source: LEGO Group Sustainability Reports (2012–2023).

The table shows the rate of females at director levels within the company from 2012 to 2023. There has been a general upward trend in female representation, starting at 34% in 2012 and reaching 41.5% by 2023. The most significant growth occurred between 2012 and 2014, with a notable rise from 34% to 43%. However, there was a dip in 2019 when the rate fell to 36%, followed by a gradual recovery in subsequent years. Despite some fluctuations, the data reflect a steady commitment to improving gender diversity at leadership levels, although recent years show slower progress.

3.1.3. Injury Rate

Injury rate is a critical employee indicator in CSR evaluation, mirroring the company's commitment to workplace safety and employee well-being. It measures the frequency of work-related injuries per a set number of hours worked. A lower injury rate indicates better safety practices and a healthier work environment, while higher rates may signal the need for improved safety protocols, training, and compliance with regulations to protect employees from occupational hazards.

Table 3. LEGO Group Injury Rate (2012–2023)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Injury Rate (%)	1.9	1.7	1.7	1.4	1.3	1.4	1.3	0.9	0.4	0.4	0.5	0.6

Source: LEGO Group Sustainability Reports (2012–2023).

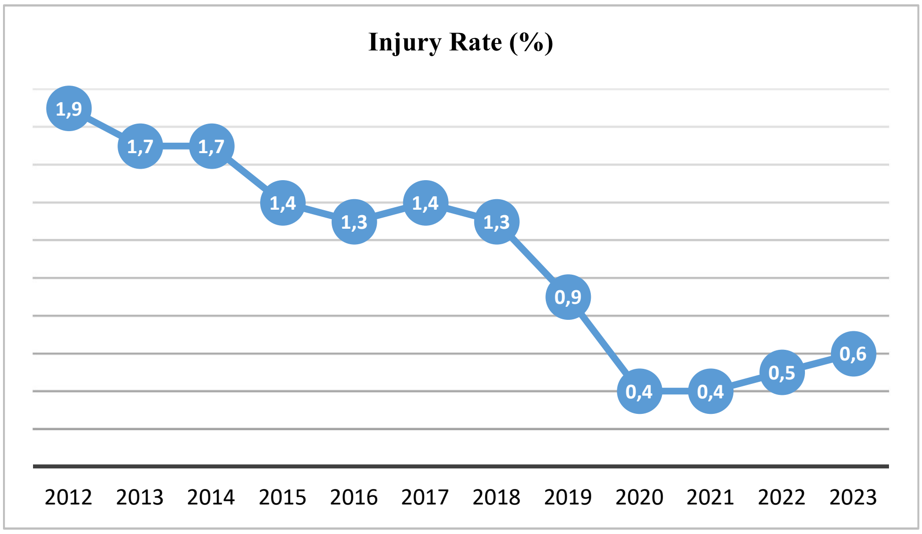

Figure 3. LEGO Group Workplace Injury Rate (2012–2023)

Source: LEGO Group Sustainability Reports (2012–2023).

The injury rate data from 2012 to 2023 demonstrate a significant improvement in workplace safety over the years. Starting at 1.9% in 2012, the rate steadily declined to a low of 0.4% in 2020 and 2021, indicating the effectiveness of safety measures and protocols implemented by the company. However, there has been a slight uptick in the injury rate in 2022 and 2023, rising to 0.5% and 0.6% respectively. While the overall trend reflects positive progress in reducing workplace injuries, the recent increase suggests the need for renewed attention to safety practices to prevent any further rise and ensure the company maintains its commitment to employee well-being.

3.2. Environmental Indicators

Environmental indicators in CSR evaluation assess a company's impact on natural resources, focusing on metrics like carbon emissions, energy usage, waste management, and water conservation. These indicators reflect the company's commitment to sustainability and reducing its environmental footprint.

3.2.1. Carbon Emissions

Carbon emissions, as an environmental indicator, measure the amount of greenhouse gases a company releases into the atmosphere, typically in metric tons of CO2 equivalent. Reducing carbon emissions is a key component of corporate sustainability efforts, reflecting a company's commitment to mitigating climate change and transitioning to cleaner, more energy-efficient practices.

Table 4. LEGO Group Carbon Emissions (2016–2023)

	2016	2017	2018	2019	2020	2021	2022	2023
Carbon Emissions (Tons)	98 865	100 444	109 310	110 637	111 037	134 047	130 635	119 089

Source: LEGO Group Sustainability Reports (2016–2023).

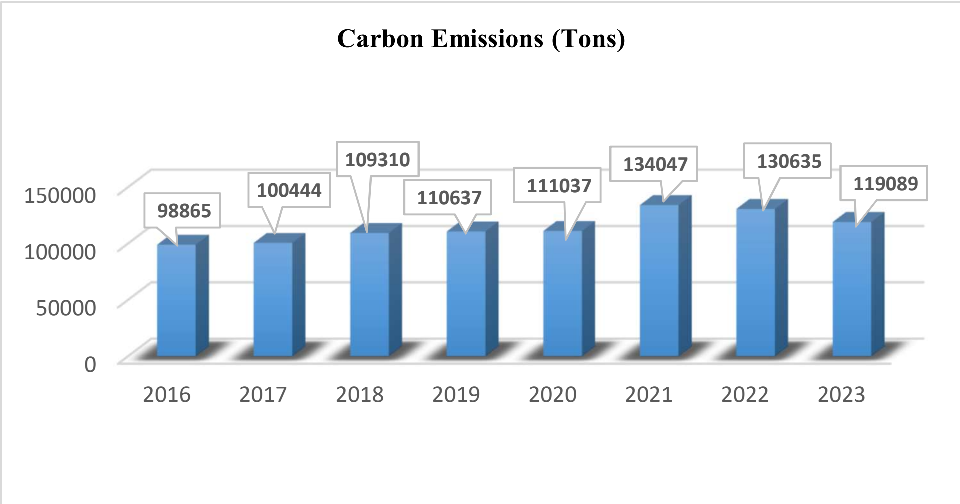

Figure 4. Annual Carbon Emissions of LEGO Group (2016–2023)

Source: LEGO Group Sustainability Reports (2016–2023).

The carbon emissions data from the LEGO Group show a general upward trend from 2016 to 2021, with emissions increasing from 98,865 tons in 2016 to a peak of 134,047 tons in 2021. This rise may indicate increased production or energy consumption over the period. However, in 2022 and 2023, there is a notable reduction, with emissions falling to 130,635 tons and then further to 119,089 tons. This recent decline suggests that the LEGO Group has likely implemented more effective carbon reduction strategies, signaling progress toward improving sustainability and addressing its environmental impact. Nonetheless, the company still needs to maintain momentum to achieve further reductions.

3.2.2. Water Consumption

Water consumption is a critical environmental indicator that measures the amount of water a company uses in its operations. It reflects the organization's impact on local water resources and its commitment to sustainable water management. Reducing water consumption indicates efforts to conserve water, improve efficiency, and minimize the environmental footprint, basically in industries where water use is significant. Effective management of water resources is essential for both operational sustainability and community responsibility.

Table 5. LEGO Group Water Consumption (2012–2023)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Water consumption 1000 m^3	279	339	424	528	538	684	683	712	703	821	867	809

Source: LEGO Group Sustainability Reports (2012–2023).

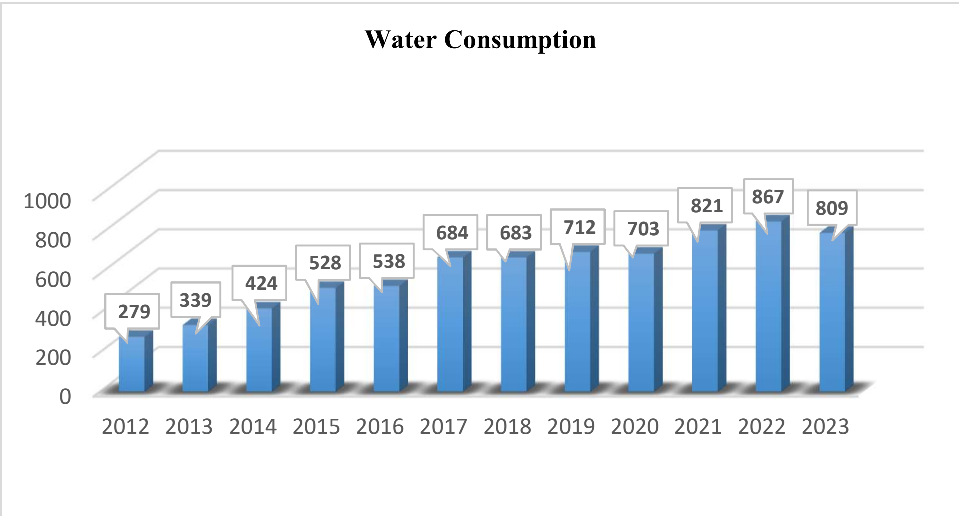

Figure 5. LEGO Group Water Consumption Over Time (2012–2023)

Source: LEGO Group Sustainability Reports (2012–2023).

The water consumption data from the LEGO Group show a significant upward trend from 2012 to 2022, increasing from 279,000 m³ in 2012 to a peak of 867,000 m³ in 2022. This consistent rise suggests growing water usage, likely driven by increased production activities or facility expansions. However, in 2023, there is a slight decline in water consumption to 809,000 m³, indicating a potential shift toward more efficient water management practices. While the reduction in 2023 is a positive sign, the overall trend highlights the need for sustained efforts to optimize water use and implement conservation strategies to mitigate the environmental impact of operations.

3.2.3. Waste Management

Waste to landfill is an important indicator of a company's waste management efforts, measuring the amount of waste that is disposed of in landfills rather than being recycled, composted, or repurposed. Reducing waste to landfill reflects a company's commitment to sustainability by minimizing its environmental impact, promoting circular economy practices, and improving waste reduction strategies. Effective waste management efforts, such as diverting waste from landfills, are key to achieving corporate environmental goals and reducing the overall ecological footprint of operations.

Table 6. LEGO Group Waste to Landfill (2012–2023)

	2012	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
Waste to landfill (Tons)	1708	1459	1407	1073	937	409	557	480	381	115	16	9

Source: LEGO Group Sustainability Reports (2012–2023).

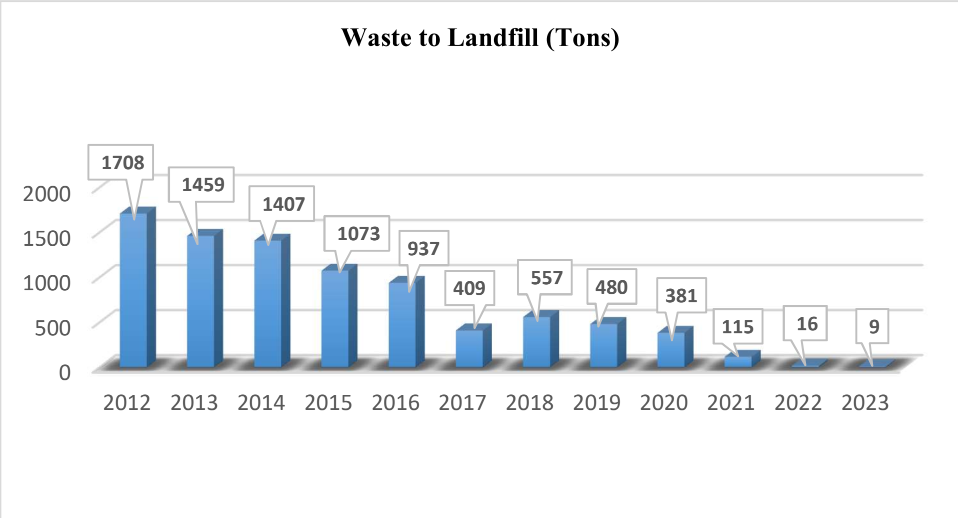

Figure 6. LEGO Group Waste to Landfill Statistics (2012-2023)

Source: LEGO Group Sustainability Reports (2012–2023).

LEGO Group's waste to landfill data reflects substantial and consistent reductions in waste disposal over the years. Starting at 1,708 tons in 2012, the company significantly decreased waste sent to landfills, reaching a minimal 9 tons by 2023. This impressive decline highlights the LEGO Group’s strong commitment to improving its waste management practices, likely through increased recycling, waste diversion strategies, and sustainability initiatives. The near elimination of waste to landfill in recent years demonstrates a successful shift towards more environmentally responsible operations, reflecting progress in achieving their waste reduction goals.

3.3. Community Indicators

Community indicators in CSR evaluation assess a company's contributions to societal well-being through initiatives like charitable giving, volunteerism, and local community development. These metrics reflect the company's commitment to fostering positive social impact and strengthening its relationships with the communities in which it operates.

3.3.1. Community Engagement

Community engagement can serve as a key indicator for evaluating Corporate Social Responsibility (CSR) initiatives, measuring the extent to which a company actively involves and positively impacts local communities. High levels of community engagement, such as volunteer programs, partnerships with local organizations, and responsiveness to community needs, often reflect a company's commitment to CSR and its effectiveness in creating shared value.

Table 7. LEGO Group Children Reached by Community Engagement (2014–2023)

	2014	2015	2016	2018	2019	2020	2021	2022	2023
Number of Children	50 000	66 000	100 000	839 120	1 859 601	3 229 390	3 513 924	9 882 512	9 861 354

Source: LEGO Group Sustainability Reports (2014–2023).

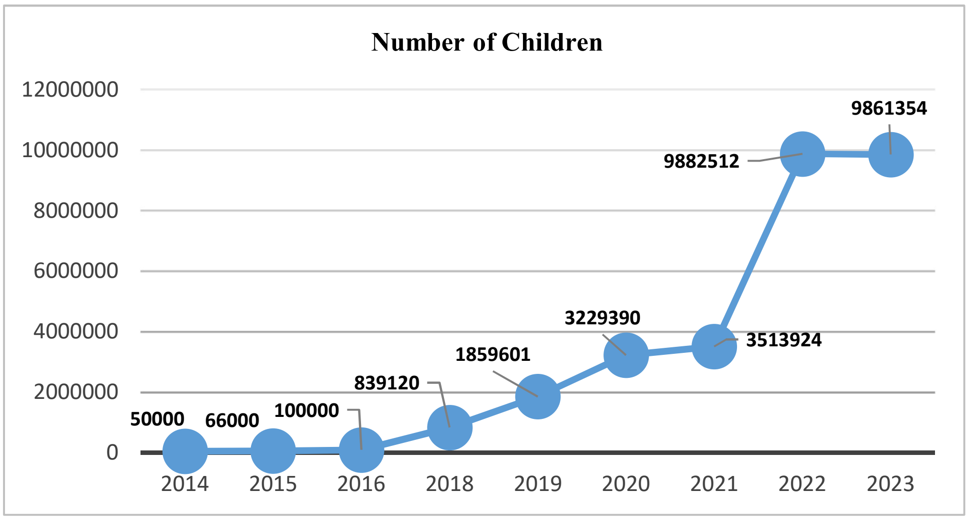

Figure 7. LEGO Group Children Reached by Community Engagement (2014–2023)

Source: LEGO Group Sustainability Reports (2014–2023).

The data presented in this table showcase the LEGO Group's remarkable growth in reaching children over a decade, from 2014 to 2023. Starting with a modest 50,000 children in 2014, the company's impact expanded exponentially, culminating in nearly 10 million children reached by 2023. This trajectory reflects LEGO's likely increased focus on corporate social responsibility and child-centric initiatives. Notable jumps occurred between 2017-2018 and 2021-2022, suggesting significant expansions or new programs during these periods. The consistent upward trend, with a slight plateau in recent years, indicates LEGO's sustained commitment to engaging with and positively impacting children's lives, possibly through educational programs, charitable efforts, or other outreach activities. This growth aligns well with LEGO's core business of producing toys and educational products for young people, demonstrating a synergy between their commercial offerings and social impact goals.

3.4. Customers Indicators

Customer indicators in CSR commitment focus on measuring a company's responsiveness to customer needs, satisfaction levels, and overall customer experience. These metrics can include customer satisfaction scores, product quality and safety measures, and the effectiveness of customer support and complaint resolution processes. By prioritizing customer-centric indicators, companies demonstrate their commitment to ethical business practices and social responsibility, which can enhance brand loyalty and contribute to long-term business sustainability.

3.4.1. Product Recall

Product recalls serve as a key metric of Corporate Social Responsibility (CSR) toward customers, demonstrating a company's commitment to consumer safety, accountability, and transparency by addressing defects and preventing harm.

Table 8. Product Recall at LEGO Group (2012–2023)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Product recall (Number)	0	0	0	0	0	0	0	0	0	0	0	0

Source: LEGO Group Sustainability Reports (2012-2023).

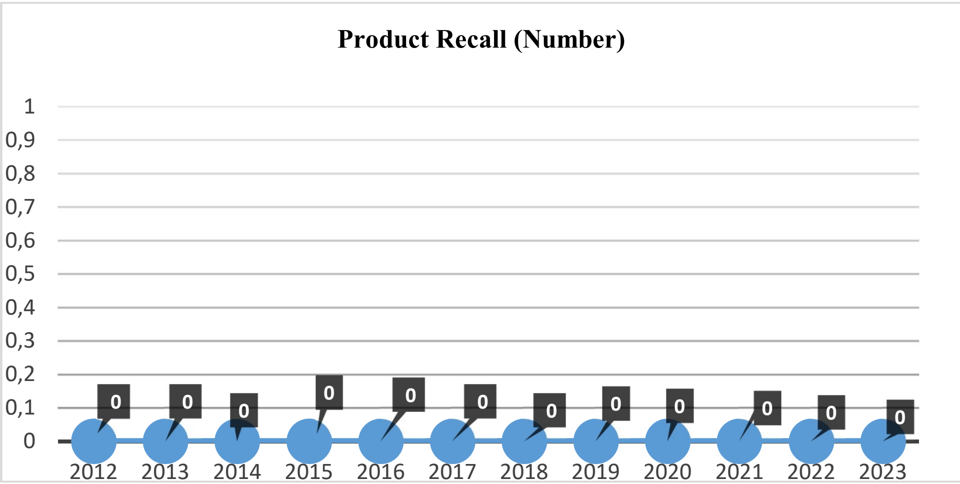

Figure 8. LEGO Group's Record of Product Recalls (2012–2023)

Source: LEGO Group Sustainability Reports (2012–2023).

The data presented in this table show an impressive and consistent track record for the LEGO Group regarding product recalls from 2012 to 2023. Over this 12-year period, the company has maintained a perfect record of zero product recalls. This exemplary performance speaks volumes about LEGO's commitment to product quality, safety standards, and rigorous quality control processes. It suggests a robust approach to design, manufacturing, and testing that effectively prevents safety issues or defects from reaching consumers. Such a consistent record is particularly noteworthy in the toy industry, where product safety is paramount due to the primary consumer base being children. This zero-recall history likely contributes significantly to LEGO's reputation for reliability and safety, potentially enhancing consumer trust and brand loyalty. It also reflects positively on the company's risk management and corporate social responsibility practices, demonstrating a strong commitment to customer safety and satisfaction.

4. CORPORATE REPUTATION AT LEGO GROUP 2013–2023

The LEGO Group has consistently maintained a strong global reputation, positioning itself as a leader in the toy industry. Its performance on the RepTrak platform, which evaluates company reputations based on various factors, provides valuable insights into how LEGO is perceived by stakeholders over time. By examining both its ranking and score, we can better understand the fluctuations in LEGO's reputation and its overall market presence.

RepTrak is a platform and corporate reputation measurement tool that helps companies assess how stakeholders perceive them across various dimensions. It was developed by the Reputation Institute (now known as The RepTrak Company) and is one of the most widely used frameworks for quantifying corporate reputation.

The RepTrak methodology involves collecting real-time survey data from stakeholders, such as customers, employees, and investors, to measure how they feel, think, and act toward a company. It evaluates reputation on a scale from 0 to 100, using seven key drivers: Products & Services, Innovation, Workplace, Governance, Citizenship, Leadership, and Financial Performance. By analyzing these drivers, RepTrak offers insights into the company's strengths and areas needing improvement. This data help organizations track their reputation over time, benchmark against competitors, and make strategic decisions to improve their standing in the market (RepTrak, 2024).

Table 9. LEGO Group RepTrak Ranking and Score (2012–2023)

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
LEGO Ranking	10	10	9	6	6	2	2	2	1	1	3	1
LEGO Score	76.35	75.02	75.01	76.69	77.4	79.46	77.9	83.9	80.1	80.4	71.2	76.8

Source: RepTrak Platform Reports (2012–2023).

The LEGO Group's ranking on the RepTrak platform has shown a notable rise over the years, reflecting a strong reputation performance. Starting at the 10th position in both 2012 and 2013, LEGO consistently improved its rank, reaching 6th place by 2015 and maintaining that position through 2016. A significant breakthrough occurred in 2017 when LEGO jumped to the 2nd position, which it retained through 2018 and 2019. This upward momentum culminated in achieving the 1st rank in 2020, a position it held again in 2021. However, the company saw a slight decline in 2022, falling to 3rd place, before returning to 1st place in 2023. Overall, LEGO's ranking over this period demonstrates a remarkable trajectory, consistently placing it among the top companies, with several years at the very top.

Figure 9. LEGO Group RepTrak Ranking (2012–2023)

Source: RepTrak Platform Reports (2012–2023).

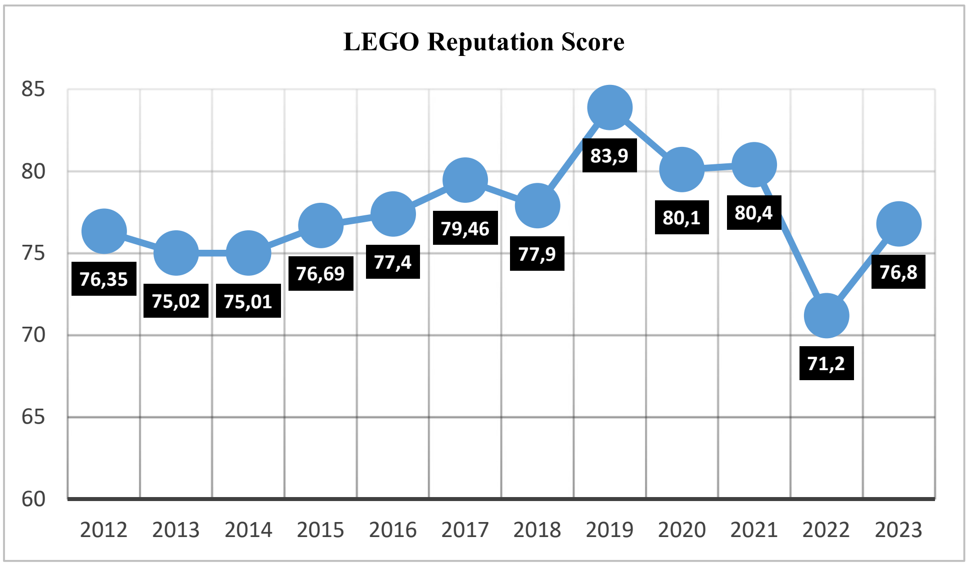

Figure 10. LEGO Group Reputation Score (2012–2023)

Source: RepTrak Platform Reports (2012–2023).

In terms of the scores LEGO Group received, the company demonstrated steady progress over the years, with slight fluctuations. Starting with a score of 76.35 in 2012, LEGO experienced a minor drop in 2013 and 2014 but recovered by 2015 with a score of 76.69. It continued to improve its performance, achieving 79.46 in 2017 and peaking at 83.9 in 2019, the highest score recorded in this period. After a slight dip in 2020, with a score of 80.1, LEGO maintained consistent scores above 80 through 2021. In 2022, LEGO saw a significant drop to 71.2, before bouncing back to 76.8 in 2023, marking a recovery in its reputation score.

5. EXPLORING THE CORRELATION BETWEEN CORPORATE SOCIAL RESPONSIBILITY INDICATORS

Following the verification of the normality assumption for the study variables, Pearson's correlation coefficient was applied to explore the relationships between the study variables (Cohen, 2003). The table below presents the results of the correlation analysis, highlighting the relationship between quantitative corporate social responsibility (CSR) indicators as independent variables and corporate reputation ranking as the dependent variable.

Table 10. Correlation Test between CSR Indicators and Corporate Reputation

CSR Indicators	Pearson Coefficient	Significance
Injury Rate	0.835**	0.000
Carbon Emissions	- 0.164	0.306
Water Consumption	- 0.934**	0.000
Community Engagement	- 0.359	0.126
Waste to Landfill	0.944**	0.000
Women Workforce	- 0.199	0.268
Employees Satisfaction	- 0,014	0.483

** Correlation is significant at level 0,01.

Source: SPSS Output.

The correlation analysis reveals a complex interplay between LEGO Group's CSR indicators (environmental, social, employee, and customer metrics) and their impact on corporate reputation. Notably, the data indicate a strong positive correlation between waste to landfill and the company's reputation ranking ($r = 0.944$, $p < 0.01$). This finding suggests that improvements in waste management, particularly the reduction of waste sent to landfill, are closely associated with an enhancement in corporate reputation. Conversely, another key environmental indicator, water consumption, demonstrates a significant negative correlation with reputation ranking ($r = -0.934$, $p < 0.01$), signifying that reduced water usage contributes positively to the company's standing. Consequently, LEGO Group's water management practices emerge as a pivotal factor in bolstering its corporate reputation.

In addition to environmental indicators, employee-related metrics exhibit notable correlations. Specifically, the employee injury rate shows a strong positive correlation with the corporate reputation ranking ($r = 0.835$, $p < 0.01$). This result suggests that a higher number of worker injuries is associated with a negative reputation ranking. This finding highlights the importance of prioritizing employee health and safety as a key element in sustaining and enhancing a company's reputation. The correlation emphasizes the critical role that proactive measures in workplace injury prevention play in shaping external perceptions of the company.

Other CSR indicators present weaker correlations with reputation ranking, pointing to varying levels of influence. For instance, carbon emissions and community engagement reveal weak to moderate negative correlations with reputation ranking ($r = -0.164$ and $r = -0.359$, respectively, $p > 0.05$). While these indicators do not demonstrate a statistically significant impact, they still suggest that efforts in reducing emissions and fostering community involvement could contribute to improving corporate reputation. Likewise, the Employee Satisfaction Score shows a negligible negative correlation ($r = -0.014$, $p > 0.05$), indicating limited direct influence on reputation. The rate of women in the workforce also displays a weak negative correlation ($r = -0.199$, $p > 0.05$), suggesting that this social metric may not be a primary driver of reputation improvements within the LEGO Group during the period under study.

CSR indicators with weaker correlations, such as employee satisfaction and carbon emissions, invite further exploration. One plausible explanation is the lower visibility of these initiatives to key stakeholders, limiting their perceived impact on corporate reputation. For example, while reducing carbon emissions is critical for sustainability, it may not resonate as strongly with consumers compared to waste management.

In conclusion, the findings from this correlation analysis underscore the nuanced relationship between CSR performance and corporate reputation at the LEGO Group. Environmental management, particularly in areas like waste to landfill and water usage, plays a pivotal role in shaping public perception and corporate standing. Moreover, the analysis reveals the importance of employee health and safety, as reflected in the injury rate, as a critical factor in enhancing the company's reputation. Other CSR indicators, while displaying weaker correlations, still point to opportunities for continued improvement. Overall, this analysis highlights the multifaceted nature of CSR contributions to corporate reputation, with some areas exerting more influence than others in defining public and stakeholder perceptions.

6. CONCLUSION

The LEGO Group's commitment to CSR from 2012 to 2023 has led to significant achievements, particularly in waste reduction and employee safety, which strongly correlate with enhanced corporate reputation. Progress in water consumption management has also been commendable. However, weaker correlations in areas such as carbon emissions, community engagement, and employee satisfaction reveal opportunities for a more balanced and comprehensive CSR strategy.

LEGO's emphasis on environmental sustainability and workplace safety reflects the unique priorities of the toy industry, where consumer expectations favor visible and impactful actions, such as product safety and ecological stewardship. This focus has proven effective but diverges from broader CSR literature that often highlights the importance of employee engagement and community involvement. Expanding efforts in these dimensions could further strengthen LEGO's reputation.

Looking ahead, maintaining excellence in environmental and safety initiatives will be essential, but greater attention to employee satisfaction and community engagement could enhance stakeholder trust and loyalty. Transparent communication of CSR achievements and alignment with global sustainability goals, particularly in carbon reduction, will solidify LEGO's position as a leader in responsible business practices.

This study not only offers actionable insights for LEGO but also provides a blueprint for CSR strategies across the toy industry. Companies can benefit from prioritizing impactful activities like waste reduction while ensuring clear and consistent communication of achievements. By adopting a balanced approach to CSR, businesses can align with stakeholder priorities and navigate the complexities of corporate responsibility.

Future research should explore causal relationships between CSR efforts and corporate reputation, employing methodologies such as longitudinal studies or multi-variable regression analysis. These approaches would yield deeper insights into the interplay between CSR metrics, helping organizations strategize more effectively for sustained success and positive societal impact.

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ECONOMIC POLICY UNCERTAINTY AND STOCK MARKET DEVELOPMENT IN NIGERIA

Development in global space and Government interference in the day-to-day economic activities as well as stock market forces are responsible for steady spread of economic policies uncertainty (EPU) around the world. Even though uncertainty policies disturb sectors, economic agents respond to this uncertainty policies in different manners, specifically when provoked with an unforeseen shock. In light of this, the aim of the study focused on link between EPU and stock market development proxied with stock traded volume in Nigeria. *Expost facto* research design and quarterly data were employed within data scope year of 2010 to 2023. Finding revealed that economic uncertainty index, money supply, interest rate, crude oil prices significantly affect stock trade volume used as proxied for stock market development. Thus, the study concluded that domestic stock investors should diversified across sectors so as to lessen quantum of risk exposure from unpredictable macroeconomic policies from money supply, interest rate, crude oil prices in Nigeria.

Keywords: crude oil prices, interest rate, money supply, stock market development, uncertainty index.

1. INTRODUCTION

Stock market development is a global phenomenon platform that act as intermediaries' functions from surplus unit to deficit unit as well as finance economic activities of global, developed, emerging and developing economies. Stock market development involves financial deepening and stock market trade volume which enhance financial intermediation process of extending surplus funds to deficit unit or deficit investor. In this study, stock market development is the improvement in stock traded volume and financial investment in stock market (Abdulraheem, Ogbeide, Adeboje, Musa, 2019). Stock market development includes healthier inducements for cautious stock indices monitoring, enhanced risk management procedures, expanded access to financial instruments, and a wider range of options and opportunities to invest in stock market.

Improved stock market development metrics contribute to healthier risk management, transparency, and governance procedures as well as sound financial resource allocation to stock market. Consequently, stock market development promotes economic possibilities

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among economic agents which improved growth likelihoods. Empirical assessment of stock market development and its determinant in Nigeria stated that ratio of stock traded as a percentage of GDP which reflects stock traded depth were between 86.8%, 61.41% and 57.76% for South Africa while Nigeria recorded 57.4%, 40.7% and 47.2% of stock market traded volume within the period of 2020, 2021 and 2022. This indicated that Nigeria had lower stock market traded volume compare with South Africa (World Bank Report, 2022). Despite positive impact of stock market development in an economy, weak institutions or feeble institutional quality operating within the confines of economic policies hampered the stock market development in Nigeria after independence, which had a detrimental effect on the role of financial intermediation platform of stock market. Nonetheless, in spite of government efforts, Nigeria's stock market still not well developed. Nigeria's stock market is either underdeveloped or developing, as seen by the low numbers given for the major stock market development indices value triggered by economic uncertainty.

Economic policy uncertainty (EPU) is the situation of unstable economic policies from the Government. Uncertainty over policies, such as monetary, fiscal, and regulatory policies, is known as EPU. It mostly twigs from probability that existing policies may alter in the future (Danisman, Ersan, & Demir, 2020). EPU focused on unpredictable effects of new policies on the economy and the private sector placed by economy authorities (Ng, Saffar, Zhang, 2020). Nonetheless, the growing uncertainty surrounding economic policy is a crucial aspect that could have a major impact on how well the Nigerian stock market performs. The impact of EPU on the financial sectors of different nations have been a worry for policymakers worldwide since the financial meltdown of 2007–2009. This worry is further supported by researchers such as Baker, Bloom, and Davis (2016), Liu and Zhang (2020), Lo and Rogoff (2015), Nagar, Schoenfeld, and Wellman (2019), and Ozili (2021) which show that global and domestic crises-related slow recovery of both advanced and emerging countries which were caused by uncertainty in economic policy.

EPU is the possibility that the policies in place will change which animatedly determined financial development investors make decisions. Uncertainty over economic policies can obviously cause economic agents to postpone making decisions about investment which may adversely influenced stock market development in Nigeria. This is due to the fact that economic agents would naturally be frugal with their spending and investment decisions when there is uncertainty about economic policy and little to no understanding about the direction the economy will take in the future. There were many sources of EPU in Nigeria ranges from fuel subsidy removal, proposed reconfiguration of bank capital based, unstable oil prices, oil shock, floating of Naira against US dollar, surprising and swift Central bank intervention and uncertain government responses (Ozili, 2021; Salisu, A., Salisu, S., Salisu, S., 2023); all these EPU were also peculiar to Nigeria economy.

According to Bloom, Kose, and Terrones (2013), there are a number of factors that contribute to economic policy uncertainty, including shifts in financial and economic policies, recessions and crises, declines in productivity, natural disasters, terrorism, war, and sharp drops in commodity prices, among others. Nigeria has had a number of occurrences that have caused economic policy uncertainty during the past few periods ranges from terrorism, banditry, the renew hope agenda of president Tinubu administration reform policies, while some of these occurrences were local, others had an international scope; thus, these EPU indices unfavorably to stock market development measures.

The influence of EPU on stock market development measure with stock traded turnover has not received much attention in empirical research conducted within and outside Nigeria; despite the possibility that growing literature on economic policy uncertainty could have a negative effect on stock market development proxied with stock market trade volume. This leaves a significant vacuum or research lacuna in the literature, which this study aims to address. The majority of research studies in the literature have, in fact, primarily concentrated on how EPU affect macroeconomic variables such as exchange rate, All Share Index, interest rate, industrial production and employment (Ahir, Bloom, Furceri, 2022; Al-Thaqeb, Algharabali, 2019; Alawadhi, Alshamali, Alshamal, 2021; Bahmani-Oskooee, Saha, 2019; Riaz, Hongbing, Hashmi Khan, 2018; Zalla, 2016; Arouri, Estay, Rault, Roubaud, 2016; Raulatu, Ugbem, Augustine, Paul, 2019; Ukwueze, Asogwa, Odo, 2018; Salisu et al., 2023). Therefore, there exist empirical gap to the best of researcher's knowledge within and outside Nigeria contexts to investigate how EPU influence stock market development in Nigeria which served as the motivation for this study. In light of the gap identified, the aim of the study focused on effect of EPU and stock market development proxied with stock traded volume in Nigeria. Also, as established by various scholars such as Ng, Saffar, and Zhang (2020), Baker, Bloom, and Davis (2016), Liu and Zhang (2020), Lo and Rogoff (2015), Nagar, Schoenfeld, and Wellman (2019) and Ozili (2021) that circumstances surrounding stock market, economic growth and EPU were negatively influenced by unpredictable shock events and market forces. Thus, this study hypothesized that; EPU may have negative and significantly influence stock market development in Nigeria.

2. LITERATURE REVIEW

This sub-chapter focused on conceptual definition of stock market development proxied with stock trade volume and economic policy uncertainty.

2.1. Stock Market Development

Stock market development is conceptually viewed as way of; (1) collecting and analyzing investments and capital base; (2) enabling financial risk management, and stock trading; (3) pooling savings; and (4) simplifying trade of financial instruments. Thus, this study proxied stock market development from stock market perspective by using stock trade turnover. Stock trade turnover is the volume stock traded and it is measure by Stock traded volume ratio to market capitalization.

2.1.1. Stock Traded Turnover

According to Abdullahi and Fakunmoju (2019), stock turnover is the ratio of the market capitalization value to the financial value of the traded stocks over a given period of time as measured by stock traded volume. Stock market traded turnover is an important indicator for stock market development specifically in the developing stock market like Nigeria. Loukil, Zayani and Omri (2010) accentuated that market information spread boosted investors' patronage which in turn increases stock market turnover. This study employed stock market turnover to measure stock market development.

2.2. Economic Policy Uncertainty (EPU)

Gulen and Ion (2016) defined Economic Policy Uncertainty (EPU) as the inability of economic agents to accurately forecast whether, when, and how the government will alter its current economic policy. The ultimate definition of economic policy uncertainty is the way in which fluctuations in market development circumstances influence economic decision-making and, consequently, the conduct of economic subjects. EPU can also be traced to political decision-making affecting the behaviour economic agents in Nigeria in present or future decisions. Qijiao (2021) argued that unpredictable decision by Government or economic regulators regarding various sectors in an economy that will determine reaction of populace or consumers is categorized as economic policy uncertainty.

The study constructs an index of economic policy uncertainty (EPU) for Nigeria following the news-based approach developed by Baker et al. (2016). The index is based on news articles published by Nigerian newspapers over the period of 2010–2023. The computed index tracks major Economic, Policy and Uncertainty events in the country, increasing during periods of higher uncertainties around key economic and political developments.

According to Abdullah (2020), EPU arises when an economic agents had insufficient or no knowledge available to predict an economy's future policies. In an uncertain environment, economic agents have limited knowledge of present conditions and potential future outcomes, and policymakers are unable to fully predict anticipated events that may occur. Thus, EPU focused on non-existence of information forecasting of economy path policies. EPU is one of the major issues that is more characterized with developing economies due to unstable economic authorities in making economic decisions.

2.3. Theoretical Framework

This study anchored on real options channel and precautionary savings channel theories; as the both underpinned theories explain how EPU affect financial development via stock market development and economic growth.

- **Real Options Channel Theory**

Bernanke (1983) and Brennan and Schwartz (1985) are the authors of this hypothesis. The genuine option theory is based on the idea that businesses have a series of real alternatives regarding potential investments to make. The value of options associated with non-reversible investments is the subject of the real options channel. In particular, once an investor embarks on an investment that is entirely or partially irreversible, he will incur significant costs should he decide to exit the venture. The economic agent will lose the investment's immediate profits if he decides to postpone it, but he will again have the choice to make the investment or not in the next time. The economic agent will wait to acquire fresh relevant information that might probably help him make a better judgment regarding the investment because he is unable to predict what profits could result from the venture. Therefore, when it comes to hiring and investing in initiatives for which the costs of adjustment always make such an investment costly to reverse, uncertainty makes organizations cautious about what they do (Ogbuabor, Onuigbo, Orji, Ojonta, 2021). Thus, unforeseen circumstances affect investment in an economy.

- **Precautionary Savings Channel Theory**

Carroll and Kimball (2016) connote precautionary saving as the additional savings that emerge from a household's knowledge of future uncertainty that may affect investment. In order to protect themselves against uncertainty, a household can save more money by either cutting back on spending or working longer hours. Precautionary saving is, thus, the response of current spending to future risk based on the current situation. A rise in uncertainty about future income flow leads to an increase in savings when risk aversion is declining (Leland, 1968). Economic agents reduce their consumption and increase their output in order to protect themselves from impending bad events when faced with uncertainty.

Salisu et al. (2023) demonstrated that a high level of uncertainty about the household's future income distribution leads to precautionary saving. Moore (2016) showed that decreased growth in durable goods consumption and economic uncertainty led to an increase in the household saving ratio. In conclusion, the cautious savings channel may result in an increase in investment and a drop in household consumption. Thus, both real options channel and precautionary savings channel theories explained how uncertainty event determine macroeconomic investment.

2.4. Empirical Review and Gap in the Literature

Though there had been several related studies, however, scholars focusing on how Economic Policy Uncertainty (EPU) affect stock market development proxied with stock trade turnover close to non-existence to the best of researcher's knowledge. However, Gilal (2019) studied the link of EPU on Indonesian stock returns within 2000–2017 while Baker, Bloom, Davis and Sammon (2021) investigate how policy uncertainty affect USA corporate investment. Findings revealed that EPU dejected investment in the USA which encourage precautionary delay due to irreversible investment as well as EPU had inverse effect on stock return in Indonesia.

Also, Bahmani-Oskooee, and Saha (2019) examined irregular influenced of policy uncertainty on stock prices in the USA, Canada, UK, Korea and Japan using the nonlinear autoregressive distributed lag (NARDL). Finding revealed that policy uncertainty has an irregular short-term effect on stock prices in the USA, Canada, UK, and Korea, while all five markets experienced significant long-term impacts of uncertainty. The study also found that rising policy uncertainty has short-term adverse effects on stock returns in the USA, Canada, UK, and Japan, and that lowering policy uncertainty has positive impact on stock prices in Canada, Japan, and the UK. Zalla (2016) investigated how EPU affected stock exchange, interest rate, industrial production and employment in Ireland. The study established that EPU innovation negatively influenced macroeconomic and financial variables. Arbatli, Davis, Ito, and Miake (2017) found that elections, leadership transitions, financial crisis, the USA debt downgrade of 2011, the Brexit referendum, and the recent pronouncement of Japan on consumption tax caused by EPU which in turn reduced employment, investment and output performance in Japan. These empirical studies reviewed above failed to consider crude oil prices, money supply and foreign direct investment in modelling stock market development and EPU. Thus, these variables considered as variables modelling gap among past related studies.

Furthermore, Riaz, Hongbing, Hashmi, and Khan (2018) empirically examined connection between EPU and other macroeconomic variables in the U.S. using the ARDL. It was revealed that stock returns from transportation industry unfavorably influenced by unpredictable economic policies. Abdullah (2020) assessed the impact of EPU on stock returns in a number of Gulf nations of Kuwait, Saudi Arabia, Qatar, Oman, United Arab Emirates, and Bahrain. It was shown that stock returns of these Golf nations were strongly affected by U.S. EPU. Rehman, and Apergis (2019) investigated the association between the sensitivity of EPU and investor's sentiment in Asian and European markets within 1995 to 2015 and their study established that ambiguity around economic policies had adverse reflection on investors' sentiment.

Lastly, Ogbuabor, Onuigbo, Orji, and Ojonta (2021) investigated the influenced of EPU on the Nigerian Stock Market. It was revealed that all-share index and EPU have a consistent long-term connection with EPU having a major adverse influence on all-share index in Nigeria. Salisu et al. (2023) focused on predictability of the EPU and its connection with exchange rates and stock prices and finding revealed that EPU negatively affected exchange rate and stock prices in Nigeria. Similar studies by Caldara, and Iacoviello (2022) on geopolitical risk, Faccini, Matin, and Skiadopoulos (2021) focused on uncertainty surrounding climate policy, the COVID-19 pandemic-related global fear index developed by Salisu, and Akanni (2020), and the COVID-19 pandemic-related uncertainty model developed by Narayan, Iyke, and Sharma (2021); they all found that geopolitical risk and uncertainty events negatively affected economic growth.

It is evident that past related studies majorly focused on how EPU affects the stock market All Share Index, interest and exchange rates, industrial production and employment among others within and outside Nigeria; but these past related studies failed to investigate how economic policy uncertainty (EPU) influenced stock market development proxied with stock market trade volume. Thus, there exist empirical gap this study intended to fill. Therefore, based on aforementioned empirical reviewed and gap identified, this study developed hypothesis that; EPU has negative and significant influence on stock market development proxied with stock trade volume in Nigeria.

2.5. Conceptual Framework

The conceptual framework below depicted the link influence of EPU and money supply, interest rate, crude oil prices and foreign direct investment as control variables on stock market development proxied with stock traded volume. The diagram below shown conceptual framework or conceptual model reflecting econometric model of the study.

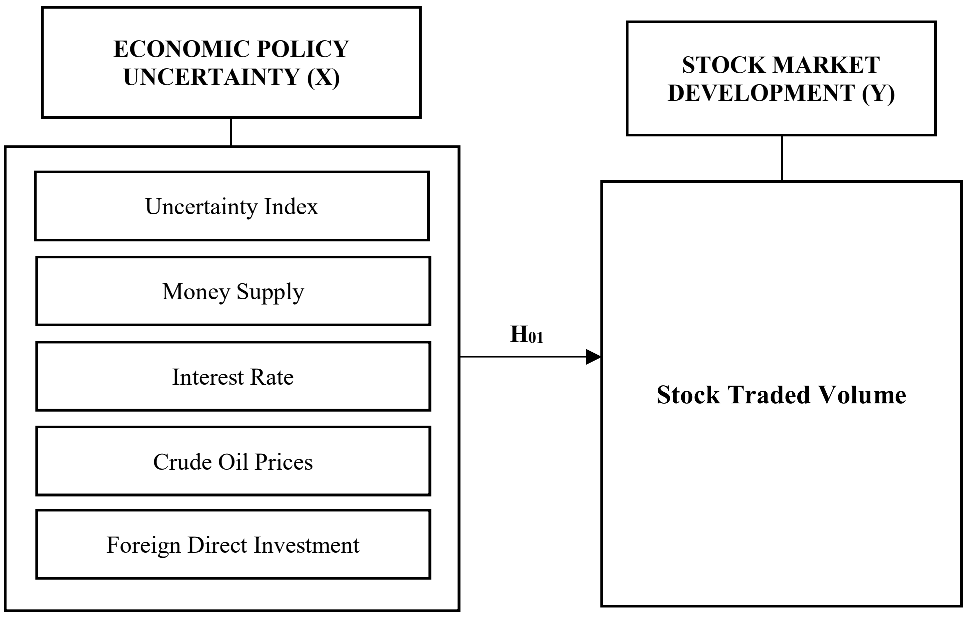

Figure 1. Economic Policy Uncertainty and Stock Market Development

Source: Researcher's Conceptual Framework (2024).

3. METHODOLOGY

This study used secondary source to provide data for the study variables and adopted an *ex-post facto* research design. Quarterly secondary data from the news-based methodology created by Baker et al. (2016) to create an index of economic policy uncertainty (EPU) for Nigeria. The news stories from Nigerian newspapers from 2010 to 2023 form the basis of the index. The calculated index tracks significant events in Economics, Policy, and Uncertainty and the Nigerian Stock Exchange Fact books in different editions from 2010 to 2023 and data were sourced from (https://www.policyuncertainty.com/wui_quarterly.html) and Central Bank of Nigeria Statistical Bulletin. The study carried out unit root tests through Augmented Dickey Fuller (ADF), Phillip Perron (PP) and Ng-Perron unit root tests and the study used Autoregressive Distributed Lag (ARDL) model proposed by Pesaran *et al* (2001) to examine short period, the long run and short run among series. Therefore, the study ARDL model was stated in equation one (1) below;

$$\Delta STV_t = \alpha_{0t} + \sum_{i=0}^{n} \beta_i \, \Delta STV_{t-i} + \sum_{i=0}^{n} \gamma_i \, \Delta EPU_{t-i} + \sum_{i=0}^{n} \delta_i \, \Delta MS_{t-i} + \sum_{i=0}^{n} \theta_i \, \Delta INT_{t-i} + \sum_{i=0}^{n} \vartheta_i \, \Delta COP_{t-i} + \sum_{i=0}^{n} \vartheta_i \, \Delta FDI_{t-i} + \emptyset_1 STV_{t-1} + \emptyset_2 EPU_{t-1} + \emptyset_3 MS_{t-1} + \emptyset_4 INT_{t-1} + \emptyset_5 COP_{t-1} + \varepsilon_t - - - - Equation\ 1$$

Where:
STV = Stock Trade Volume
EPU = Economic Policy Uncertainty
MS= Money Supply
INT = Interest Rate
COP = Crude Oil Prices; and
FDI = Foreign Direct Investment
ε_t = disturbance term.

The above econometric model was adopted from anchored theories and reflect hypothesis developed from empirical review and gap identified.

Table 1. Measurement of Variables

Variable	Proxy	Computation	Source
Dependent Variable			
Stock Market Development	Stock Trade Volume	Ratio of Stock market Trade Volume to market capitalisation	Security and Exchange Commission Report
Independent Variables			
Economic Policy Uncertainty (EPU)	Uncertainty News Index by Baker et al.	Macro -Economic Uncertain Indices	https://www.policyuncertainty.com/wui_quarterly.html

Table 1 (cont.). Measurement of Variables

Variable	Proxy	Computation	Source
Control Variables			
Money Supply	It is M2 – time deposits + money market funds. M3: M2 + all other Certificate of Deposits (CDs) (large time deposits, institutional money market mutual fund balances), deposits of Eurodollars and repurchase agreements. M4-: M3 + Commercial Paper. M4: M4- + T-Bills (or M3 + Commercial Paper + Treasury-Bills)		Central Bank of Nigeria (CBN) Publication
Interest Rate	Prime Lending Rate		Central Bank of Nigeria (CBN) Publication
Crude Oil Prices	Bonny Light crude oil		Central Bank of Nigeria (CBN) Publication
Foreign Direct Investment	Investment Inflow		Central Bank of Nigeria (CBN) Publication

Source: Author's Computation (2024).

4. RESULT AND DISCUSSIONS

The descriptive statistics via Mean, Standard Deviation (SD), Minimum and Maximum values on dependent and independent variables of the study as well as skewness, kurtosis and the Jarque-Bera results were also presented in order to test for normality of data.

Table 2. Summary of Descriptive Statistics of Variables

Statistics	Mean	Max	Min	S/D	Skew	kurt	Jarque-Bera (JB)	Prob
EPU	371.35	577.14	223.74	74.36	0.20	2.89	1.73	0.044
INT	11.91	18.72	7.71	3.05	0.54	1.16	7.031	0.030
MS	32724.8	69841.9	20989.8	9432.6	0.73	2.38	8.210	0.407
COP	48.01	98.43	6.43	2.28	0.34	1.45	12.583	0.130
FDI	102.89	784.54	119.78	3.98	1.73	1.93	9.873	0.054
STV	93.87	827.37	146.98	4.82	2.15	1.41	2.873	0.643

Source: Author's Computations (2024).

The skewness and kurtosis values in table 2 depicted descriptive trend of the study variables. The probability of the Jarque-Bera statistic confirms that Economic Policy Uncertainty (EPU), Interest Rate (INT), and Foreign Direct Investment (FDI) were not normally distributed since probability of Jarque-Bera statistic were less than 5% while Money Supply (MS), Crude Oil Price (COP) and Stock Trade Volume (STV) were normally distributed since the probability of the Jarque-Bera statistic were greater than 5%. Both skewness and kurtosis shown that EPU, INT, MS, COP, FDI and STV trend to the positive side which means that there were increased in MS, INT, EPU, COP, and STV but the high level of corrupt practices and bureaucracy in the Nigeria system could not allow this positive increment in MS, INT, EPU, COP, and STV reflect in the Nigeria economy as a whole.

Correlation Test

Table 3 depicted correlation coefficient indicates multi-collinearity issues. The correlation coefficients were all significantly below 0.8, signifying that there is no problem of multi-collinearity in the model, according to the results.

Table 3. Correlation Matrix

Variables	EPU	INT	MS	COP	FDI	STV
EPU	1.0					
INT	-0.18	1.0				
MS	0.62	-0.29	1.0			
COP	-0.04	0.04	-0.19	1.0		
FDI	-0.26	0.05	0.62	0.12	1.0	
STV	-0.32	-0.53	0.22	0.72	0.29	1.0

Source: Author's Computation (2024).

The Table 3 above further revealed that there exists connection between the study variables. EPU had negative relationship with INT, COP, FDI and STV which indicated that there is inverse relationship between INT, COP, FDI and STV while EPU had positive connection with MS. This insinuates that uncertainty news on economic and sector matters had negative connections on stock traded volume in Nigeria except MS. This correlation result reflected that despite increase in MS, INT, FDI and uncertainty news (EPU), there is no reflection on stock traded volume in Nigeria and this was resulted from political instability, corrupt practices and lack of political will to take advantage of positive increment of MS, INT, EPU, COP, and FDI.

The table 4 focused on the stationarity reaction of the study variables. The study adopted 5% level of significance for unit root tests.

Table 4. Panel Unit-Root Test for Study

Variables	Augmented Dickey Fuller (ADF) Unit Root Test		Ng-Perron unit root test		Phillip-Perron (PP)-Fisher Test		Integration
	Level	First Difference	Level	First Difference	Level	First Difference	
EPU	0.125	8.735**	1.634	7.094**	1.073	6.329**	I(1)
INT	5.976**	-	2.519**	-	4.834**	-	I(0)
MS	0.850	6.208**	0.423	8.632**	1.043	7.934**	I(1)
COP	1.245	2.525**	0.141	3.276**	0.932	6.231**	I(1)
FDI	3.784**	-	4.178**	-	3.972**	-	I(0)
STV	4.892**	-	4.978**	-	5.021**	-	I(0)

Source: Researcher's Computation (2024) (**) 5% Level of Significance.

Table 4 depicted the unit root of the series for the study variables. There exists a mixed stationarity reaction of the study variables. Thus, Autoregressive Distributed Lag (ARDL) was the appropriate estimate to be employed.

Table 5. F-test results for ADRL bounds co-integration and Critical Values of the ARDL Test

Dependent Variable	**Functional Model**	**F-statistics**	**Cointegration Status**
STV	STV = f(EPU, INT, MS, COP, FDI)	6.421	Cointegrated
Level of Significance	***Lower Bound I(0)***		***Upper Bound I(1)***
1%	1.32		2.86
5%	2.53		3.94
10%	1.30		2.76

Source: Author's Computation (2024).

Table 5 depicted the bound test longrun movement of study variables which shown that F-statistics was 6.421 greater than upper bound I(1) of 3.94, thus null hypothesis of no co-integration among study variables was rejected. This indicated that there exists longrun connection among study variables.

Table 6. ARDL Short Run Error Correction and Long Run Estimates

Short Run Error Correction				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
ΔSTV	-0.119	0.101	-1.178	0.242
ΔEPU	-1.625	0.013	-5.011	0.021
ΔINT	-2.083	0.073	-6.253	0.000
ΔCOP	-0.144	0.007	-3.513	0.000
ΔMS	0.325	0.003	7.151	0.000
ΔFDI	-0.201	0.002	-0.186	0.852
CointEq(-1)	-0.676	0.067	-8.130	0.000
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
EPU	-2.363	0.589	-5.231	0.001
INT	9.704	1.965	4.837	0.000
COP	-0.213	0.018	-8.502	0.000
MS	0.482	0.049	9.793	0.000
FDI	0.010	4.237	0.002	0.218
C	-0.001	0.003	-0.185	0.853

Dependent Variable: Stock Traded Volume (STV)

Notes: $R^2 = 0.648$, Adjusted $R^2 = 0.627$, F-statistic = 84.301, Prob(F-statistic) = 0.000 and Durbin--Watson stat = 1.983

Δ denotes first difference operator

Source: Author's Computation (2024).

Table 6 depicted that short-run ARDL model depicted that EPU had negative and significant influenced on STV (β = -1.625, t-stat = -5.011, $P<0.05$), and also INT (β = -2.083, t-stat = -6.253, $P<0.05$), COP (β = -0.144, t-stat = -3.513, $P<0.05$) had adverse influenced on STV but MS had positive and significant influenced on STV (β = 0.325, t-stat = 7.151, $P<0.05$) while FDI (β = -0.201, t-stat = -0.186, $P>0.05$) negative and insignificant influenced on STV short-run. This indicated that EPU, INT, COP, and MS were major determinant of STV in the short run. Likewise, in the long run it was shown that FDI had a positive and insignificant effect on STV (β = 0.010, t-stat = 0.002, $P>0.05$), while MS (β = 0.482, t-stat = 9.792, $P<0.05$) and INT (β = 9.704, t-stat = 4.837, $P<0.05$) had positive and significant influences on STV (β = -1.625, t-stat = -5.011, $P<0.05$) and COP (β = -0.213, t-stat = -8.502, $P<0.05$) had adverse and significant impact on STV. The finding implies that uncertainty news, INT, COP and FDI play significant role in STV. The unpredictable information surrounding uncertainty news (EPU) in Nigeria scare away stock investors to invest in the Nigeria stock market which caused declined in stock turnover. In Nigeria, the Central Bank of Nigeria (CBN) continue to increase interest rate which is not attractive to stock investors in Nigeria to borrow more funds from financial intermediators to purchase stock or participate in stock market as well as volatility in COP make stock investors not to invest in quoted oil and gas companies in Nigeria. Thus, priority and sound analysis should be given to EPU, INT, FDI, COP, and FDI in Nigeria which will determined whether an investor should invest in Nigeria stock market or not.

Lastly, Adj.R^2 value is 0.627 indicated that roughly 62.7% of STV variability explained by explanatory variables. With a Prob(F-statistic) = 0.000 and an F-statistic of 84.301, the entire model is statistically fitted and free from serial autocorrelation problem since the Durbin-Watson statistic is roughly 2.0. EPU and other explanatory variables' short-term dynamic impact on STV is investigated, and the results are shown in Table 6 with statistical significance and a negative coefficient of ECTt-1 which indicated that if the variables deviate from the equilibrium level by 1% in the short term, they will return to it at a rate of 67.6% quarterly. Thus, null hypothesis that, EPU does not significantly influenced STV was rejected. Related studies such as Ogbuabor, Onuigbo, Orji, and Ojonta (2021), Rehman, and Apergis (2019), Riaz, Hongbing, Hashmi, and Khan (2018) aligned with this study finding that EPU influenced Nigerian Stock Market via All Share Index, investor's sentiment and stock returns. However, they all failed to established how EPU affect stock traded turnover, thus, there still room for further discussion.

5. CONCLUSION AND RECOMMENDATIONS

Considering finding achieved, the study concluded that EPU determined stock market traded volume in Nigeria. The study employed Baker et al. (2016) Economic Policy Uncertainty (EPU) Index to scrutinize whether and how predominant policy uncertainty, INT, FDI, COP, and FDI stimuli their decision to patronize stock market in Nigeria. To this end, the study creates a novel measure of stock investors exposure to economic policy uncertainty combining with INT, FDI, COP, and FDI in determining stock traded volume or stock turnover in Nigeria. Therefore, stock investors within and outside Nigeria contexts should give maximum consideration to uncertainty news on economic policies, interest rate, foreign direct investment, crude oil prices and money supply before investing in the Nigeria stock market since Nigeria as an economy belong to the category of developing nation with unstable macroeconomic policies and inconsistent in Government policies. Thus, the study recommended that it is imperative for policy makers in Nigeria to guarantee that potential investors and other economic agents are always aware of the government's policy orientation so as to be guided in their stock investment decision model. This is due to the possibility that the stock market may suffer from the uncertainty brought on by these economic uncertainty issues such as terrorism, farmers/herders clashes, ethnic and religious tensions, exchange rate policies, political tensions and that the Nigerian stock market requires a more stable and investment-friendly environment to thrive which will enhance sound increment in stock turnover and patronage in the Nigerian stock market. Also, domestic stock investors should diversify across sectors in the Nigerian stock market which will lessen high level of risk exposure from unpredictable policies from money supply, interest rate, and crude oil prices which might enhanced stock turnover in the Nigeria stock market.

Suggestion for Further Study

Considering study variables employed in modelling EPU and stock development as control variables such money supply, interest rate, crude oil prices and foreign direct investment. However, there other control variables not employed in this study such as public debt or level of taxes, industrial production or employment among others should be consider in future related studies when modelling EPU and stock market development in Nigeria.

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MOTIVATION OF HOUSING AND COMMUNAL SERVICES EMPLOYEES IN THE PERIOD OF INDUSTRY 4.0 DEVELOPMENT IN THE VUCA WORLD

The article considers problems and ways of solving the adaptation and development of personnel policy in the conditions of the fourth-generation industrial revolution, which requires the development of innovative forms and methods of management of human resources with the necessary competencies for effective activity in the VUCA conditions. The article presents the results of the analysis of the impact of the fourth industrial revolution on the nature and content of industrial workers' labor, which necessitates the improvement of organizational and economic mechanisms of personnel management on a wide range of issues, one of the most relevant among which is employee motivation, or rather its innovation-oriented development, aimed at enhancing productive innovation activities at the modern level of Industry 4.0. The results of the research let proposing the toolkit of innovation-oriented motivation of employees of housing and communal services enterprises that can be used for the development of instrumental modules of mechanisms of attraction and motivation of professionals having the necessary qualification level in the sphere of innovations.

Keywords: motivation, high-tech enterprises, Industry 4.0, VUCA-world.

1. INTRODUCTION

It is not hard to see that the VUCA world is linked to the 4th industrial revolution, but it affects not only economies or national interests but also people, each one of us. Today's world is characterized by instability, uncertainty, complexity, and ambiguity. It has come to be known as the VUCA world and is characterized by rapid change, unpredictability, considerable difficulty in determining the future based on the past, a diversity of evidence, causes and influencing factors, and multidimensional situational conditions. In these

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volatile times, human resources are critical. Only those companies that use their human resources to their fullest potential will stay afloat.

Today's world is changing faster, and changes are affecting different areas of businesses. This shows that personnel must gain knowledge in different areas. Achieving success requires changes in the development of not only new personnel skills but also new and more attractive career heights. Along with this, organizations need to focus on leadership development, structural issues, cultural diversity, technology, and employee experience enrichment with new and more interesting ways of working. Given the pace of change and the constant need to adapt, it's no surprise that CEOs of large companies have identified building the organization of the future as the most important challenge of the coming decades.

Back in the 1990s, the U.S. military coined the term VUCA, an acronym for Volatility, Uncertainty, Complexity, and Ambiguity (Kelly, 2022). With it, they tried to explain the new conditions of warfare in the unpredictable modern world without rules. Then the term was picked up by businessmen and strategic consultants as they sought to explain why it was no longer possible to plan, predict and maintain the former stability of the corporate world. Recently it has become finally clear that it is useless to wait out this uncertainty, but it is necessary to adapt to it. And this requires a radical change in the processes and tools of human resource management. Under the conditions of increased uncertainty, the personnel service (department of organizational development, management, etc.) must finally stop being associated with stability, control, and long-term planning. In the organizations of housing and communal services, which are better able to survive and develop in conditions of uncertainty, the human resources departments are the most agile, innovative, and technically savvy.

The availability of labor resources and the efficiency of their use have a direct impact on the efficiency of production activities, economic indicators of the organization, financial stability, competitiveness, and market position. In the sphere of housing and communal services the problem of labor efficiency is much more acute than in the industrial sectors, and in the Ukrainian economy. Even though many organizations of housing and communal services took a course on modernization of the material base and reorganization of the management system, without solving personnel problems, successful reform of the industry is impossible. The system of housing and communal services needs to cope with the problem of lack of qualified personnel, to solve the issue with motivation and incentives for working personnel, to introduce more modern methods of personnel management, which would consider the specifics of the organizations in the industry in the period of industry 4.0 development in the VUCA world.

Theoretical and empirical methods: analysis, synthesis, generalization, comparison.

Relevance of the topic. The importance of personnel in the sphere of housing and communal services is indisputable, as it is the quality of services provided, as well as the degree of satisfaction of the population, depends on the personnel.

The main problems of employees in the sphere of housing and communal services are:

- low professional training;
- lack of motivation among the staff of the housing and communal services enterprises;
- lack of labor resources.

The purpose of this study is to identify the peculiarities of the development of human resources policy of housing and communal services in the period of development of industry 4.0 in the VUCA world.

2. STATEMENT OF THE PROBLEM

Until now in scientific circles, the problem of studying the world experience of motivation of employees of housing and communal services and adaptation of the personnel of enterprises to the current economic and political conditions in Ukraine remains relevant. At the present time, the personnel problems are not given proper attention. To solve these problems, it is necessary to use non-standard approaches. And one of these approaches is the motivation of housing and communal services employees in the period of development of industry 4.0 in the VUCA world. Issues of management of employees of housing and communal services, and regulation of relations between employees of housing and communal enterprises have long been studied by Ukrainian and foreign scientists, among which should be noted (Rosenberger, 2021; Werkmann-Karcher, Rietiker, 2020; Kelly, 2022; Dolgalova, Yeshchenko, Fasolko, Mykhalchenko, Udovychenko, 2020; Loop, 2016; Lazear, 2016).

3. MAIN RESULTS

In the study of personnel processes in the organization of housing and communal services, being in crisis conditions, today it is accepted to allocate such main tasks, as the definition of development of a progressive system of personnel management; revealing of so-called "problem areas", that is the phenomena, slowing down successful development of the enterprise; estimation of adaptive possibilities of collective and its readiness for changes. Additionally, quantitative statistical data are collected: personnel costs, statistical data on the characteristics of the total labor force at the enterprise; labor productivity indicators, etc. A revolution is taking place before our eyes concerning everything related to human resources management: organizational structure, processes, tools, and, most importantly, human resources managers themselves. These revolutionary demands allow organizations to build skills to get out of their discomfort zone and build leadership skills in a VUCA world.

Today's human resources managers are fast and efficient project managers, salespeople, and engineers. Increasingly, companies are now outsourcing routine administrative and supervisory functions (paperwork, payroll, and payroll) to other departments (e.g., legal, accounting, clerical, and internal control). All this is done to maximize the speed of HR teams, relieving them of unnecessary burdens. First in the queue of processes to be overhauled is performance management. In the VUCA world, key target indicators become obsolete within a month, so it makes no sense for managers to wait until the end of the year to routinely discuss with an employee whether they have achieved their goals.

One way out is to switch to shorter cycles of goal setting and evaluation: a quarter, a month, or even a week. There is another way, which at first glance seems counterintuitive: reduce the weight of the bonus in the total income of employees, i.e., move from managing the monetary unit to managing the word (to regular feedback and a productive corporate culture). Then employees will worry less about “things have changed again” and can focus on the tasks at hand. Many utility companies are currently reviewing their approaches to performance management (König, Stahl, Wiegand, 2016).

The classical competence system has proven to be too rigid and fragile, and therefore an unreliable foundation for building a human resource management function in the face of increased market activity. Key employees should have the widest range of competencies: understanding of the business, effective and persuasive communication, and the ability to manage complex situations.

Another way is to reformulate the classic set of competencies into a more modern set (e.g., trainability, adaptability, and ability to act in situations of uncertainty). The top-level positions will require an external talent pool. Learning and development, like adaptation, turn into a speed game. It is difficult to plan the necessary competences, so part of the training will inevitably happen “just in case”. Learning in today's volatile and unpredictable world will have to happen every day, not several times a year in training (Milner, 2021).

For the convenience of diagnostic assessment of the state of personnel management, the system is conditionally subdivided into strategic and operational levels. At the strategic level, the activity of the top management of the housing and utilities enterprise in building a strategy for the formation and use of labor potential, as well as its compliance with the current situational conditions, compliance of the organizational structure with the goals and objectives of the enterprise, characteristics of organizational culture, the level of competence of strategic managers, the nature of relations between the administration and the personnel (conducted by interviewing key managers, studying business plans and reports on the results of activity At an operational level it is estimated efficiency of work with human resources; presence or absence of necessary components of a personnel management system, their adequacy to the purposes of the enterprise, correctness of their performance. Here such components, as conformity of personnel policy, personnel planning, principles of selection and employment, adaptation, stimulation of labor, evaluation, and training, rotation, organization of work, career planning, and dismissal of employees are examined.

The actual problem of the modern Ukrainian economy is the formation of a new “direction”, providing a steadily positive dynamics in the direction of the economy of innovative development. One of the fundamental factors in creating such an innovative “direction” is the innovation of labor collectives, the mass, and magnitude of which will form the appropriate effect, determined mainly by the intellectual resources of workers, namely, their effective and purposeful formation, development and use in innovative processes. In this regard, the need to search for adequate managerial approaches, allowing to development of the necessary management systems and mechanisms required in the conditions of implementation of promising directions of innovation development of the domestic economy is actualized. One of the priority directions, in this case, becomes the motivation of employees. The fact is that in modern socio-economic conditions, determined by the powerful influence of the technological factor (the fourth industrial revolution (Eden, 2020), there are significant changes in the ideas about the sources of competitive advantage. Among the main such sources are considered technological innovations, both in production and management (Maruyama, 2021).

The intensification of innovative development of housing and utilities enterprises is reflected in the nature and content of employees' labor activity, posing fundamentally new tasks to personnel management services (Loop, 2016). It becomes more rational to influence the executives indirectly, replacing the traditional administration with the implementation of alternative management styles, which primarily involve the recognition of personal professional merits of specific highly qualified specialists, transparency of the results of labor activity, and the possibility of providing information for self-assessment.

As a result, the heads of many enterprises of housing and communal services of an innovative type strive to increase the percentage of non-material incentives for the work of their employees.

In general, in the process of historical development, the system of labor relations in the form of interrelated elements “subject of labor” – “labor process” – “object of labor” constantly underwent and continues to undergo consistent and logically determined transformations. The relationship between these elements is currently undergoing particularly significant changes (Kelly, 2022), formed under the influence of the modern stage of technological development (the fifth, and sixth technological stages), generating not only industry of a new type – Industry 4.0, but also has much broader consequences in the form of the formation of society also a new type – Society 4.0.

The employee, as a subject of labor, has consistently passed the way through the change of his role in labor relations on the chain from a worker to a non-alternative source of innovative development. The last circumstance defines the necessity of the introduction of principally new forms of labor relations in housing and communal companies, bringing organizational conditions of labor force used in correspondence with world tendencies based on consideration of interests of both workers and employers in innovative development on the level of the modern fourth industrial revolution. The labor activity of a modern worker acquires more and more pronounced specificity, which should be considered when introducing new forms of motivation. The peculiarities of modern labor include the change of traditional boundaries of labor activity and strengthening of the role of individual qualities of workers, and their competences because of the development of both divisions of labor and labor cooperation at a new level.

Accordingly, all new forms of production-labor relations are gradually spreading in the modern labor market. Their formation occurs in line with the development of innovative business and is characterized by certain specialized approaches to the motivation of workers. One of the predominant among which becomes the level of employees' remuneration depending on their qualification level in the sphere of innovations, i.e., on this basis the appropriate level of remuneration for labor results are established. The priorities which predetermine innovation-oriented orientation of personnel motivation improvement are actualized (Figure 1), focused on formation, development, and effective use of qualification level of employees of intellectual-innovative labor and increase of intrafirm innovative activity on this basis, transformed into innovative capital of enterprise (Figure 2).

The most relevant result of human resource management in the period of industry 4.0. becomes the qualitative development of personnel, aimed at innovative results, integrated into the qualification level of innovative sphere employees. Generalization and systematization of approaches (Dolgaleva, 2018) to the definition and content of the concept of “motivation” allowed to clarify and define the concept of "innovation-oriented motivation", more relevant in modern socio-economic conditions (active innovative transformations, determined by the formation and development of industry 4.0).

Innovation-oriented motivation is proposed to be understood as a purposeful and dynamic process of motivating employees to innovative activities to achieve the goals and objectives of the organization in the innovative development. As the main result and target of innovation-oriented motivation of employees, it is proposed to consider the innovative activity and formed qualification level of employees, aimed at mastering certain ways, techniques, and actions necessary in the innovation process.

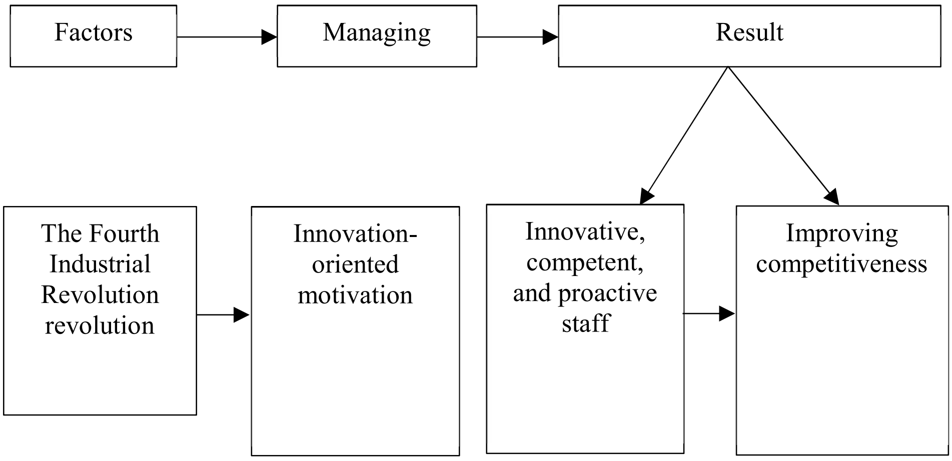

Figure 1. Innovation-oriented focus on improving employee motivation (Authors' personal contribution)

Source: Authors' own work.

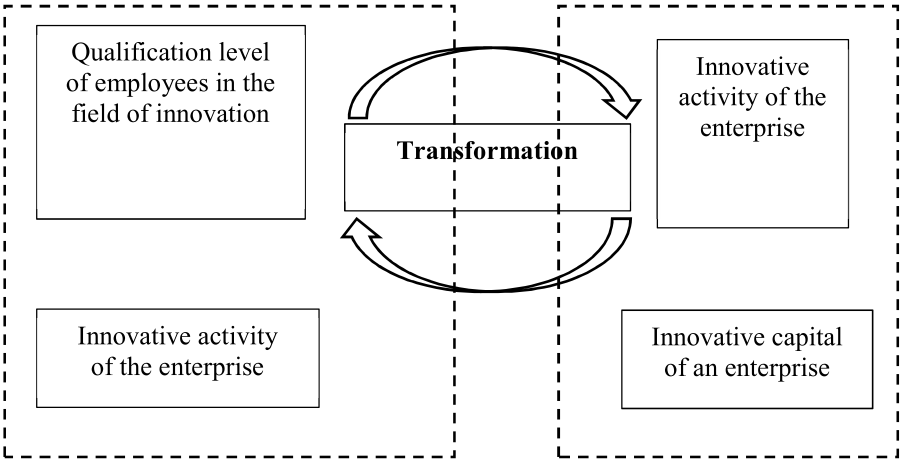

Figure 2. Economic importance of employee motivation focused on innovative results (Authors' personal contribution)

Source: Authors' own work.

The complex task of forming and development of qualification level of employees in the sphere of innovations is the establishment of optimal points of intersection between the qualification level of employees and innovative processes at the enterprise. Motivational mechanisms can play an essential role in solving this problem, aimed, first, at organizing the process of reproduction of highly skilled and innovative employees, and second, at maintaining this process at the level that corresponds to the needs of the enterprise in innovative development.

Thus, the formation and development of qualification and competence levels of employees in the sphere of innovation assume the presence of an adequate intrafirm mechanism, providing regular managerial actions, aimed at attraction, and motivating of employees of the required quality level.

This mechanism should be formed, first, considering the need to create a development platform based on the synthesis of technological and managerial competencies of personnel to support and develop a strategic portfolio of innovations of the enterprise (Khetagurova, Khetagurova, Dzukaeva, 2018).

To use the innovative potential of employees more fully, determined by their qualification level in the field of innovation, activation, and effectiveness of innovative activity of the enterprise can be applied various tools of motivational nature, for example:

1. material and moral encouragement of not only innovation but also innovation associated with the commercialization of the results of intellectual work through the creation of innovative products and their commercial implementation;
2. ensuring the maintenance of effective communication with colleagues both within and outside the firm;
3. recognition of the intellectual contribution of innovators and developers in the innovative development of the enterprise;
4. provision of possibility of career development of employees with a high level of formed competences, necessary for increasing the efficiency of innovative processes.

In total it is possible to allocate the following features of motivation of the personnel at the enterprises of innovative type in the conditions of activization of innovative processes within industry 4.0:

1. Motivation system should be formed in terms of the motivation of creative activity and creativity of employees in the sphere of innovations: employees should be provided with such conditions, under which they will be able to fully realize their personal innovative potential in the interests of economic development of the enterprise.
2. One of the essential motives inducing employees to unlock their innovation potential is "feeling their place" in an industrial company, namely, awareness of their importance and involvement in the development of the innovative activity of the enterprise.
3. The value of intangible incentives in modern industrial enterprises increases significantly, among them the provision of career development opportunities is actualized.

Motivational measures to stimulate the innovative activity of employees can be diverse for different participants of the innovation process (Table 1) (Sarris, 2019). Organizational support of any process is a set of subprocesses and actions leading to the improvement of interrelationships of elements of this process to obtain an effective result that meets certain program requirements and targets.

The process of personnel management of modern enterprises in the interests of innovative development requires the improvement of organizational support for employee motivation, aimed at the formation and development of qualification and competence levels of personnel in the field of innovation.

Table 1. Motivational measures to stimulate personnel to develop and implement innovations at high-tech enterprise

Group of participants in the innovation process	**The purpose of motivation**	**The content of the activities that provide:**	
		moral incentive	**material incentive**
Employees of research and development departments (creation of innovations - intellectual work).	Provide creative activity in intellectual work.	Participation in scientific and technical events (conferences, seminars, congresses). Publication of research results in scientific publications. Patenting of inventions, and utility models. Publication of monographs in foreign publishing houses.	Bonus payments are based on the results of research and development work. Subsidies for participation in scientific and technical events, publications of results of intellectual work, and patenting.
Engineering and technical employees and workers of production units involved in the implementation of innovations (creation of innovations - innovation activities).	Ensure innovative activity in innovative activities.	Preparing employees for innovation (removing barriers to "non-acceptance"), organizing and conduct of training sessions, questioning, developing of special measures to prepare employees for innovation.	Additional bonus payments for the development of measures to prepare employees for innovation.
Production personnel who are not directly involved in innovation processes.	Prevent opportunities for resistance to change (creative destruction).	Timely familiarization and moral preparation for changes aimed at innovative results.	Material encouragement to prepare a program to prevent resistance to change.

Source: Authors' own work.

Organizational support of innovation-oriented motivation of employees should not be localized exclusively within the HR service, it should penetrate "all pores" of the enterprise in the presence of an effectively functioning center of coordination and distribution of employees' resources in the field of innovation (Werkmann-Karcher, Rietiker, 2020).

The proposed set of organizational-economic and moral-psychological methods and tools of innovation-oriented motivation of employees with qualification levels in the sphere of innovations is shown and disclosed in table 2.

As the final target function of the innovation-oriented motivation of employees, it is possible to designate the effect of innovation, assuming (Ilyinskaya, Titova, 2012) the achievement of the effect of active influence of personality (labor collective) on change of public (economic and other) institutions with awareness of the moral responsibility for the initiated changes. And this effect becomes a determining factor in the deep transformation of existing or the emergence of new economic institutions.

Table 2. Tools for innovation-oriented motivation of employees

<table>
<tr><th>Tools</th><th>Contents of tools</th></tr>
<tr><td colspan="2">1. Organizational and economic methods</td></tr>
<tr><td rowspan="2">1.1. Remuneration</td><td>1. Regulation of all payments, benefits, and privileges provided to the key employees for the sphere of innovation. Payment of remuneration to employees should be carried out in accordance with the adopted compensation policy of the enterprise. The level of remuneration should create sufficient motivation for the effective work of the personnel, allowing to attract and retain competent and qualified specialists on priority kinds of economic activity of the enterprise developed on the innovation basis.
It is necessary to avoid the greater, than it is necessary, level of remuneration, and an unreasonably big gap between levels of remuneration of managers and other categories of employees.</td></tr>
<tr><td>2. Implementation of a long-term motivation program for key employees, the elements of which may include the following.
2.1. Current bonus payments to employees based on monthly performance results, for the proper performance of job duties according to the company's innovative development criteria.
2.2 One-time incentive payments to employees, motivating for operative and qualitative implementation of innovative projects, especially urgent assignments, related to them; increased efficiency and labor effectiveness in the intellectual-innovative sphere; proposal of new approaches to the solution of tasks, initiative, persistence, resources saving, implementation of especially important and complicated tasks of innovative nature.
2.3. One-time material aid of social orientation for different purposes (registration of marriage, birth of a child, death of close relatives, other emergency situations).
2.4. “Golden parachute” – the amount of compensation paid in case of early termination of the powers of senior employees at the initiative of the company and in the absence of dishonest actions on the part of these employees.</td></tr>
<tr><td>1.2. Professional development of employees</td><td>Organization and conduct of innovation-oriented retraining and advanced training:
• establishment of requirements for the employee holding a certain position, with their reflection in the job description or work instruction;
• analysis and assessment of knowledge, skills, and abilities of employees, their professional suitability and competence in the field of innovations;
• identifying the need for training and retraining of newly hired employees;
• training of employees transferred to new positions and areas;
• periodic professional development for all categories of employees;
• training of workers for the second and combined professions.
The enterprise establishes the required level of qualification and competence of personnel, provides training or retraining of employees, evaluates the effectiveness of conducted activities, and ensures that employees are aware of their contribution to the achievement of the enterprise's goals in the field of innovation. Professional development of employees should be aimed primarily at ensuring their competitiveness through improvement of professional competence; preparation of an internal candidate pool from among employees to fill managerial positions; cultivation of employees' desire for self-improvement and professional growth.</td></tr>
</table>

Table 2 (cont.). Tools for innovation-oriented motivation of employees

Tools	Contents of tools
1. Organizational and economic methods	
1.3. Formation and maintenance of qualifica-tion and competence level of employees in the field of innovation.	1. Maintaining relations with external sources of attracting qualified personnel and selection for vacant positions on the criterion of innovative competence. 2. Planning the business career of employees in accordance with the innovation strategy of the company and formation of a personnel reserve of the innovation sphere, including a reserve of managers. 3. Creation and maintenance of an information data bank of highly qualified personnel, as well as informational and technical support of the process of formation and development of qualification and competence level of employees in the innovation sphere. 4. Search for funding sources for the formation and development of qualification and competence levels of employees in the field of innovations.
1.4. Improvement of working conditions for innovation workers.	1. Normalization and tariffication of the labor process of the personnel of the innovation sphere. 2. Improvement of indicators and methods of evaluation of the results of intellectual and innovative activity. 3. Involvement of highly qualified and competent in the field of innovations specialists in enterprise management.
2. Moral and psychological methods	
Creating conditions for the social protec-tion of employees, creating a favorable social and psycholo-gical climate, as well as creating a positive image of the enterprise in the economic environment (its external and internal levels).	1. Provision of employees with free medical care under voluntary health insurance contracts. 2. Introduction of a system of partial compensation of employees' food costs. 3. Incentive payments: for anniversaries; based on the results of work in the reporting period; for vacations. 4. Organization of communication of veterans and pensioners with the enterprise: organization of festive events, and social assistance. 5. Social and psychological diagnostics of personnel and candidates. 6. Maintaining a favorable moral and psychological climate in the work collective. 7. Formation and management of organizational culture in the field of innovation management and innovative economy. 8. Application of various forms of moral encouragement of innovative employees, aimed at establishing and supporting their status at the enterprise.

Source: Authors' own work.

At the theoretical level, this effect has been substantiated by various positions. Its philosophical, psychological, sociological, anthropological, and economic justifications are known. In particular, the economic foundations of innovation are argued within the scientific school of Hays D. (Hays, 2021), whose approach reveals the innovative essence of entrepreneurship and the conditionality of innovative development of socio-economic systems by the activity of entrepreneurial activity, aimed at creating a new combination of production factors, generating new goods, markets, methods of production, sources of involvement of production factors, structural changes at the enterprise and branch level. Entrepreneurship of this kind is innovative in its subject and sphere of activity, and therefore, has a specific resource base, formed by the intellectual resources of employees (at individual and collective levels). In this regard, the need to develop not only managerial approaches but also tools for their implementation, allowing to increase the labor efficiency of employees of innovatively active industrial enterprises becomes more acute.

4. CONCLUSIONS

As a rule, at present, the motivation of employees focused on the innovative result, contributing to the formation and development of their qualification level in the field of innovation, is not sufficiently systematic. This managerial aspect is present at best in the management of large, advanced companies, but as part of other functions of personnel management or intellectual resources of the enterprise. At the same time in the Ukrainian practice of management today, there is a lack of competent employees, trained for the specifics of innovation activities, who understand the logic of the innovation process at the modern level of industry 4.0. The subjects-practitioners of the Ukrainian economy have an increasing need for intra-firm organization of motivation of formation and development of qualification level of employees in innovation, which leads to the practical importance of the proposed tools to attract, motivate, and retain persons with the necessary qualification level in the field of innovation.

If at the present level of development of management science in the field of personnel, human resources, and intellectual capabilities of employees in the theory and methodology there is a predominance of traditional approaches to management, not quite effective in conditions of active innovative transformations. Existing, as a result, unresolved issues at the level of theory and methodology of HR management, due to the intensification of innovative processes in the economy, affect the practical impossibility of ensuring effective personnel management in the new economic conditions. This article is devoted to filling the identified gaps at the theoretical and practical levels. The results of the study are useful and necessary for the formation and development of a theoretical and methodological basis for improving the organization of personnel management of innovatively active enterprises. It can be used in the development of tools, methods, systems, as well as mechanisms of management of innovation-oriented motivation of employees, allowing to maximize the effect of innovation, which is necessary to ensure sustainable innovative development of economic entities of the national economy.

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FINANCIAL TECHNOLOGY INVESTMENTS AND THEIR IMPACT ON ECONOMIC GROWTH

This study aims to measure the impact of financial technology investments on economic growth around the world during the period (2014–2023). The error correction model ECM was used, and the results of the estimates showed that there is no causal relationship between the two variables in the short term; and after testing After valuation of transactions, it turned out that the error correction coefficient CointEq is negative and significant; this explains the existence of a long-term equilibrium relationship between the study variables, and from the test of the analysis of the statement, The shocks that reflect any change in the level of GDP variable by explaining the variance that the occurrence of any single structural shock in financial technology investments by 1% has a positive impact on GDP, and after analyzing the response functions to random shocks, it was found that the degree of response of both variables has been achieved since the first period.

Keywords: financial technology, investments, digitization gross domestic product, product joint integration.

1. INTRODUCTION

FinTech is one of the innovations of the emerging industry that has created wealth in global systems and provided a range of multiple services related to digital currencies, lending, or crowd funding. In this context, it aims to compete the traditional financial methods by boosting digital services and inclusive growth worldwide. The development of FinTech is closely related to the development of the enabling technologies (Kelvin, Anna, 2018). This innovation offers valuable opportunities to improve the financial sector because it supports green financial operations through green credit and investment (Minahil, Ayesha, Saba, Amir, 2023). In addition, the financial technology investments have contributed to the development of the financial sector by attracting start-ups for growth and significant returns.

Lately, researchers started focusing on the role of FinTech in improving the financial inclusion via digital access to the financial products and services in economies or regions

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that have few financial institutions and/or less-developed financial markets (Joseph Jr, Behrooz, Hiroshi, 2023). Consequently, many countries have embraced the FinTech in order to contribute to the national economy and support the economic growth and the infrastructure. In this regard, the economic growth means constantly increasing the volume of production in a country or the gross domestic product because they are the main quantitative indicators of growth (Mladen, 2015).

As central banks began to adopt strategies aimed at enabling financial technology, startups emerged and started working for providing innovative financial services and products that simulate what the banking sectors offer, as they simplify access to financial and banking services. Because of the importance that the financial technology has received from central banks, as they are closely linked to raising countries' economic growth rates, it turned into a strategic goal that most banks seek to integrate and the use of financial technology to improve their performance rates. Based on what has been said, we shall shed light on the global investments in the FinTech sector and their impact on the economic growth global economic growth rates. In this context, we can raise the problematic of the study as follows:

This paper aims to give a comprehensive view of the development of FinTech investments around the world. by determining the relationship between FinTech investments and the world's economic growth based on the previous studies.

In order to test the hypotheses of the study and achieve its objectives, the methodology will be based on the description of the study variables and the analytical approach. Thus, we shall address the development of FinTech investments in the world. Besides, we shall rely on the investigative approach through the use of statistical analysis methods to study the relationship between FinTech investments and the global economic growth during (2014–2024).

Axes of the study:

The study revolves around:

Axis 01: Theoretical background of the study.

Axis 02: An econometric study of the impact of FinTech investments on the world's economic growth during 2014-2023.

2. LITERATURE REVIEW

FinTech has become an important modern technological tool in the provision of financial services and products because it includes innovative and advanced practices.

Concepts about the economic growth vary according to economists' perspectives. It is necessary to show two main points: firstly, such conceptions as “economic growth” and “economic development” should be distinguished, and secondly, in a variety of definitions of growth, as a rule, one or another essential characteristic of that category is reflected. (Aleksey, Yuner, 2015). In the economic theory, the concept of the economic growth implies an annual increase of material production expressed in value, the rate of growth of GDP, orin national income (Mladen M, 2015).

2.1. Financial technology and economic growth

According to multiple academic studies, investing in fintech has an important role in promoting economic growth by increasing GDP growth (Feyen et al., 2022; Haftto, 2019; Aker and Petty, 2010; Sahai, Ogawa, Khaira Wong, 2021). Moreover, several other researches have revealed a positive correlation between a country's income, measured by

GNI, per capita and the use of digital payment services, as determined by the percentage of individuals.

There are many papers investigating the relationship between FinTech and the economic growth, here are numerous research papers exploring the relationship between financial technology (FinTech) and economic growth.

This relationship is studied across various dimensions such as financial inclusion, efficiency of financial services, innovation, and impacts on traditional banking systems. Key areas of investigation often include Digital banking, online lending and payments programs, personal finance management, insurance and investment management The study conducted by Hosen et al. (2023) Using a review methodology, this paper finds that, Hosen (2023) Fintech has potential to influence the realization of increase in financial development and economic growth, only when appropriate regulation is put in place. Important policy implications and future directions are discussed accordingly.

The study conducted by Andrea Rizova (2023) investigate the impact of financial technology and financial development on economic growth in countries with different levels of economic and financial development, The results prove that financial development does have a positive impact on GDP per capita growth, but FinTech does not. However, it is inferred that FinTech has a greater positive impact on economic growth in countries with higher level of financial development.

Research has shown that high adoption of fintech is associated with economic development in reverse with economic growth which plays an important role in driving the spread of Technology and innovation, including the adoption of digital payment (Andrea Rizova, 2023). Moreover, a study from Chinoda et al. (2023) found a two-way causal relationship between economic growth and digital financial inclusion. In addition, only a limited amount of research has shown that fintech positively impacts economic growth in countries with significant development in financial sectors.

Therefore, this research focuses on the impact of the volume of investments in financial technology on the rates of economic growth aroundthe world as measured by the growth of the world's GDP.

2.2. Global investments in the FinTech

2023 has been a challenging year for the global fintech market, with both total fintech investment ($113.7 billion) and the number of fintech deals (4,547) seeing their weakest results since 2017. Faced with a host of global challenges from a high interest rate environment and high inflation, to conflicts in Ukraine and the Middle East combined with concerns about valuations and an arid exit environment, fintech investors have become increasingly cautious with their investments.

Financial technology investments in the world have achieved several developments during (2014–2022). In this line, the period of 2014–2019 saw a fluctuation in the growth of FinTech investments in line with the tireless efforts made by the government agencies of various countries to create a conducive environment towards FinTech innovations, embrace new ideas, and adopt them in the financial sectors. Then, 2020 saw the largest peak in the volume of investments thanks to the efforts of the countries, mainly with the spread of the corona virus pandemic. Thus, the governments aimed at investing in digital finance, expanding the digital banking base, providing the attractive environment for investment, stimulating innovation in the areas of FinTech, launching innovative initiatives, focusing on block chain technology and artificial intelligence, and ensuring private sector engagement with FinTech companies.

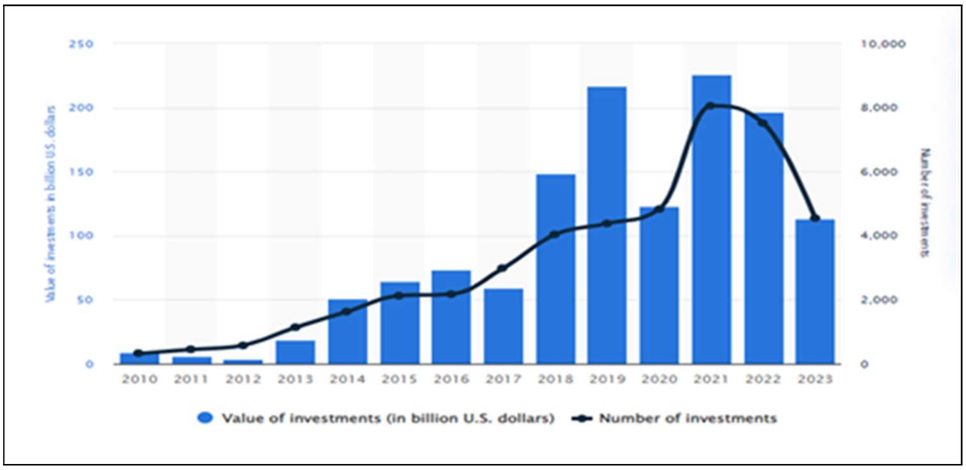

Figure 1. Provides an analytical view of the evolution of the global investments in the FinTech during (2010–2023) reference to the figure should be presented within the text

Source: https://www.statista.com/date of access 02/04/2024.

As for 2021 until the second semester of 2022, the volume of investments fluctuated due to the challenges in FinTech and the competition that emerged in the financial arena between the traditional banks and the emerging start-ups, as many banks began to rely on this technology for their new operations. In this line, despite the ongoing efforts to develop the digital systems and services, we still find gaps The finance and financial technology sector is subject to frequent updates and amendments to existing rules, making ensuring continued compliance a challenge.

3. DATA AND METHODOLOGY

3.1. Data

Through the data available from the World Bank (world, 2023), we were able to find the most important indicators related to our study, which are mainly related to investments in financial technology and the rate of economic growth in the world and measured by GDP, where we can find different indicators, such as the Global Financial Inclusion Index and the Global Development Indicators, which provide valuable insights for research on various social and economic topics.

For this research, the dependent variable of economic growth depends on the measure of the growth of the world's GDP.

The main independent variable of the study is investment in financial technology and metrics are calculated from this variable by key points (fintech deals, Payments space, Blockchain and crypto space investment). In light of this, the world record of Global investments in FinTech reached over US$210 billion in 20211. Key highlights include:

- Record 5,684 fintech deals drove the investment.
- Payments space saw US$ 51.7 billion in investment.
- Blockchain and crypto space investment soared from US$ 5.5 billion in 2020 to US$ 30.2 billion in 2021, However, in 2022, global investment in FinTech dropped by 30% from 2021.

3.2. Methodology

With the aim of studying the impact FinTech investments on the world's economic growth during 2014–2023 and the causal relationship between the two variables, we used the Error Correction Model ECM.

$$GDP= F(FI) \tag{1}$$

$$id \quad 〚= \beta 0+ \beta 1inf+ \varepsilon t〛 \tag{2}$$

Where:
- FI: Size of FinTech Investments;
- β0 β1: The model's parameters;
- εt :random error.

This model relies on FinTech investments as an interpretive variable of economic growth, while neglecting the rest of the variables that fall within the protector of the model. In order to determine the impact of the independent variables on the dependent variable, we formulate the following function:

$$GDP(t)= f(FI(t), rsd) \tag{3}$$

where:
- The economic growth (GDP): dependent variable;
- The financial technology investments FI (t): the independent variable interpreted for the affiliate variable;
- t: Random error.

For our empty study, the impact of fintech investments will be illustrated by relying on the latter's global index of GDP expressed in economic growth, by examining their causal relationship.

The following table shows the study's variables:

Table 1. Study Variables

Data Source	Type	Variable Code	VARIABLE
IIFM	independent variable	FI	fintech investments
(WDI)	dependent variable	GDP	economic growth

Source: Prepared by the researchers using EViews12 program.

Stability test of the time series of the study variables:

In order to recognize the degree of integration of time series for study variables by verifying the absence of mono root, we used the ADF test. Table 2 shows the results of the test.

Table 2. Results of Unit Root Test Using ADF

Varia-ble	Unit Root Test Using ADF								
	Intercepte			Trend and Intercept			None		
	ADF	Level 5%	Prob	ADF	Level 5%	Prob	ADF	Level 5%	Prob
GDP	-7.708977	-3.661661	0.0000	-7.705894	-3.568228	0.0000	-7.727446	-1.952066	0.0000
FI	-9.524849	-2.951125	0.0000	-9.391658	-3.548490	0.0000	-9.664393	-1.951000	0.0000

Source: Prepared by the authors using EViews12 program.

The chain associated with the GDP variable is stable at the first difference i.e. the value 7.70 = T-Statistic (in absolute terms) is greater than the table value 3.66. This is explained by the probability of this test Prob = 0.0000. It is less than the 0.05 and, therefore, we can say that the series does not have a root 1 unit.

- The chain associated with the FIP variable is stable at the first difference i.e. the value of 9.52 = T-Statistic (in absolute terms) is greater than the table value 2.95. This is explained by the probability of this test Prob = 0.0000. It is less than 0.05 and, therefore, we can say that the series does not contain a root of the unit (hence 1 1i) and that it is stable,Thus, we can say that both series are complementary with the same degree I (1).

Granger Causality Test:

This test refers to the study of the relationship direction between FinTech investments and GDP:

Table 3. Granger Causality Tests

Causal Direction	F-Statistic	Prob
FI does not Granger Cause GDP	0.49306	0.6168
GDP does not Granger Cause FI	1.52767	0.2374

Source: Prepared by the researchers using EViews12 program.

Based on the results of Granger Causality Tests, we find that:

- Test (1) examines the causality of FI on GDP. Thus, we notice that Prob = 0.6168 and accept the null hypothesis that states that FI does not cause GDP. Therefore, there is no causal link between FinTech investments and GDP.
- Test (2) examines the causality of GDP on FI. Thus, we notice that Prob = 0.2374 and accept the null hypothesis that states that GDP does not cause FI. Therefore, there is no causal link between FinTech investments and GDP.

As a result, we conclude that there is no two-way causal correlation between FinTech investments and GDP.

Johansson co-integration test:

After checking that the two series (FI, GDP) are top-notch integrals I (1), we conduct the Johansen Juselius co-integration test to check whether there is a long-termco-integration:

Table 4. Co-integration Test Results

Unrestricted Co-integration Rank Test (Trace)				
Hypothesized	Eigen value	Trace Statistic	0.05 Critical Value	Prob.**
None*	0.843291	64.5074	15.49471	0.0000
Atmost 1 *	0.309960	10.75915	3.841465	0.0010
Trace test indicates 2 co integrating eqn(s) at the 0.05 level * denotes rejection of the hypothesis at the 0.05 level ** MacKinnon-Haug-Michel is (1999) p-values Unrestricted Co-integration Rank Test (Maximum Eigen value)				
Hypothesized	Eigen value	Max-Eigen Statistic	0.05Critical Value	Prob**.
None	0.843291	53.74759	14.26460	0.0000
Atmost 1*	0.309960	10.75915	3.841465	0.0010
Max-eigen value test indicates 2 co integrating eqn (s) at the 0.05 level * denotes rejection of the hypothesis at the 0.05 level **MacKinnon-Haug-Michelis (1999) p-values				

Source: Prepared by the researchers using EViews12 program.

Based on the results of the co-integration test, we see that:

- At None *, the result of the first test is significant because the Prob value is equal to 0.0000. Therefore, we refuse the null hypothesis that states that there is no long-term balance relationship, and accept the alternative hypothesis that sates that there is a long-term balance relationship. As shown in the table above, the calculated value of the impact test is 64.5074, which is greater than the table value 15.49471 at significance level 5%. Thus, there is a co-integration.
- At Atmost 1*, the result of the first test is significant because Prob=0.0000. Therefore, we refuse the null hypothesis that states that there is one long-term balance relationship, and accept the alternative hypothesis that sates that there is a long-term balance relationship. As shown in the table above, the calculated value of the impact test is estimated at 10.75915.

Thus, we conclude that there are two complementary relationships between the study variables. Therefore, we can apply the causality test in order to know the direction of the long-term relationship and the impact between the variables.

Determination of the model's delay scores:

In order to estimate the Variant-oriented self-regression model, we shall rely on AIC and SC criteria to determine the optimal slowdowns.

Table 5. Results of the Model Delay Score

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-196.1711	NA	2955.066	13.66698	13.76127	13.69651
1	-166.1968	53.74718	493.4247	11.87564	12.15853	11.96424
2	-126.1264	66.32340*	41.23262*	9.388026*	9.859507*	9.535388*

Source: Prepared by the authors using EViews12 program.

Table 5 shows that the number of the optimal delays of the study variables is2. Thus, we can estimate the ECM model through the delay period (2).

Estimating the ECM model:

After confirming the stability of the time series and determining the degree of delay, we will estimate the ECM model through the co-integration test. Table 6 shows the results of the test:

Table 6. Results of estimating ECM

Vector Auto-regression Estimates Date: 11/11/22 Time: 18:19 Sample (adjusted): 2014Q2 2022Q2 Included observations: 29 after adjustments Standard errors in ( )& t-statistics in [ ]		
FI	**GDP**	
-14.90748 (9.29800)]-1.60330[	2.101395 (0.06606)]31.8114[	GDP(-1)
12.91859 (10.0795)]1.28167[	-1.346775 (0.07161)]-18.8070[	GDP(-2)
0.043886 (0.20404)]0.21509[	-0.000569 (0.00145)]-0.39280[	FI(-1)
0.020261 (0.20868)]0.09709[	0.001381 (0.00148)]-0.28642[	FI(-2)
34.66517 (15.4091)]2.24965[	0.669137 (0.10947)]6.11226[	C
0.157101	0.991802	R-sqaured
0.016618	0.990436	Adj-R squared
18612.11	0.939437	Sum sq.resids
27.84788	0.197846	S.E equation
1.118291	725.9300	F-statistic
-134.8812	8.582459	Log likelihood
9.646976	-0.247066	Akaike Aic
9.882717	-0.011325	Schwarz SC
34.58966	2.177940	Mean dependent
28.08219	2.023084	S D dependent

Source: Prepared by the authors using EViews12 program.

Economic analysis: Based on the results of the estimation of ECM, the determination factor is 0.99, i.e., FinTech investments explain the economic growth at 99%. Besides, Fisher's calculated value is greater than the table value. This means that the study model has statistical significance.

Residual Serial Correlation LM Test:

In order to confirm that there are no problems with the self-correlation of the study model, we use VAR Residual Serial Correlation LM Test.

Table 7. Results of Residual Serial Correlation LM Test

Lags	LRE*STAT	RAOF-STAT	DF	Prob
1	34.10687	12.70942	4	0.4957
2	3.439790	0.874459	4	0.4873
3	11.57014	3.241882	4	0.2209

Source: Prepared by the authors using EViews12 program.

The table 7 shows that:

All the probabilities (Prob) are insignificant (greater than 0.05). Therefore, we accept the null hypothesis that states that the estimated model is free from the problem of self-association of errors (the residuals are not self-related).

ECM model validity test:

We conduct the heterogeneity test to know whether the study model has a problem of heterogeneity.

Table 8. Heterogeneity Test Results

Chi-sq	df	Prob
38.40623	24	0.3315

Source: Prepared by the authors using EViews12 program.

The table shows that:

- Prob's value for Ch-Sq has reached 0.3315, which is greater than 0.05 (insignificant). Therefore, we refuse the problem of non-heterogeneity and accept the hypothesis of the constancy of the variance of the error limits of the estimated model.

Diagnosis of ECM model:

In order to check the extent to which the residuals series follow the normal distribution model, we shall use the following tests:

The tests of the residuals' natural distribution:

We conduct Skewness, Kurtosis, and Jarque-Bera natural distribution tests in order to test the null hypothesis that states that the chain of the residuals is subject to natural distribution. The tables 9, 10, and 11 show the results of the tests:

Table 9. Skewness Test Results

Component	Skewness	Ch-sq	df	Prob*
1	1.328755-	3.135028	1	0.3435
2	0.333900	62.98438	1	0.5468
Joint	3.8745123		2	0.8703

Source: Prepared by the authors using EViews12 program.

Table 10. Kurtosis Test ResultsThe second paragraph

Component	Kurtosis	Ch-sq	df	Prob*
1	3.652978	0.287415	1	0.4789
2	2.112547	0.547458	1	0.7425
Joint	0.924785		2	0.9714

Source: Prepared by the authors using EViews12 program.

Table 11. Jarque-Bera Test Results

Component	Jarque-Bera	df	Prob*
1	1.183524	2	0.2027
2	2.641648	2	0.4521
Joint	4.251478	4	0.6348

Source: Prepared by the authors using EViews12 program.

The tables show that the residuals are subject to the natural distribution because:

- The value of Skewness is 3.8745123;
- The value of Kurtosis is 0.924785;
- The value of Jarque-Bera 4.251478.

The results show that Pvalues in the three tests are insignificant, i.e., P≥0.05. Therefore, we accept the null hypothesis that states that the residuals are subject to natural distribution, and refuse the alternative hypothesis that states that the residuals are not subject to natural distribution.

Unit root test:

- This test ensures the stability of the model, as shown in figure 2.

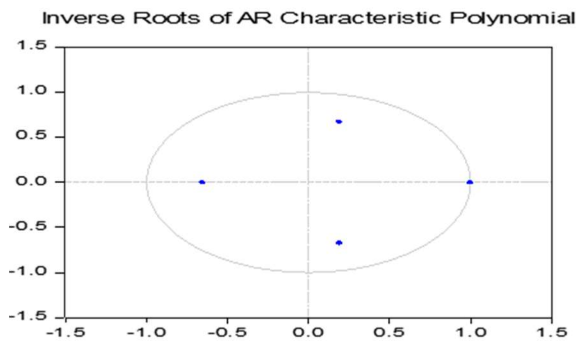

Figure 2. Unit root test results

Source: own processing.

Based on the results shown in the figure, the ECM model meets the requirements of stability. Since the roots are within critical limits, the model is stable.

The parameters significance test:

Table 12. Results of the parameters significance test

Co-integratingEq:	CointEq1	
GDP(-1)	1.000000	
FI(-1)	0.012535- (0.00892) [1.40494-]	
C	1.835312-	
Error Correction:	D(GDP)	D(FI)
CointEq1	-0.733484 (0.04083) [3.26948]	1.988895 (13.9929) [0.14214]
D(GDP(-1))	2.070052 (0.08522) [24.2905]	14.42100- (29.2079) [0.49374-]
D(GDP(-2))	1.852508- (0.20014) [9.25598-]	6.379396 (68.5953) [0.09300]
D(FI(-1((	0.001548 (0.00076) [2.04551]	0.662135- (0.25933) [2.55328-]
D(FI(-2))	0.001702 (0.00065) [2.61095]	0.364949- (0.22342) [1.63350-]
C	0.133499- (0.03559) [3.75056-]	1.386067 (12.1994) [0.11362]
0.364293	0.987114	R-squared
0.219815	0.984185	Adj. R-squared
23068.02	0.196380	Sum sq. resids
32.38127	0.094479	S.E. equation
2.521433	337.0548	F-statistic
-133.7263	29.70843	Log likelihood
9.980447	-1.693459	Akaike AIC
10.26592	-1.407987	Schwarz SC
0.900000	-0.118516	Meandependent
36.66021	0.751289	S.D. dependent

Source: Prepared by the authors using EViews12 program.

Table 12 shows that after the CointEq, ECM is negative (0.73348) and significant at a level of 5%. This is explained by a long-term balance between the variables in question, i.e. the long term of FinTech investments explains 73% of the economic growth changes, and any imbalance in any variable will be corrected in order to maintain the long-term balance.

Wald Test:

It tests the significance of the parameters in the short-term, i.e. the test of the probability that FinTech investments will not affect the economic growth in one short-term delay.

Table 13. WALD Results (Short Term significance)

Test Statistic	Value	df	Probability
Chi-square	21.25673	3	0.0001

Source: Prepared by the authors using EViews12 program.

Table 13 shows that:

- Prob value = 0.0001 is significant (less than 0.05). This means that there can be no parameters for FinTech investments in the economic growth.

Analysis of response functions:

ECM self-declining vector model allows analysis of random shocks by measuring a sudden impact (shock) in a variable on other variables(djalti)in order to follow the time path of shocks occurring at the random error level to which the study variables are exposed, and know how to respond. Let us consider figure 3.

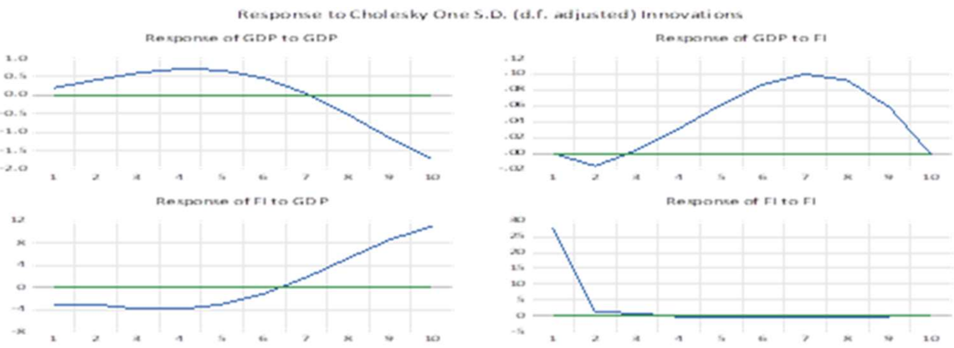

Figure 3. Results of the Analysis of the Random Shock Response Function Test

Source: own processing.

Any shock to GDP with a standard deviation of 01 will affect FinTech investments. In addition, FinTech investments' response to the change in GDP was initially in decline (negative). The second curve shows that GDP responds to the change in FinTech investments at the same pace of curve 01.Thus, the response of both variables (FI and GDP) has confirmed since the first period. Moreover, any structural shock of 1% in FinTech investments has a positive impact on GDP.

Analysis of variance:

Analysis and fragmentation of variance means measuring the percentage of variance that interprets each internal variable compared to itself and other variables, i.e. knowledge of the degree of the impact between the variables (independent variable and its interpreting variables).

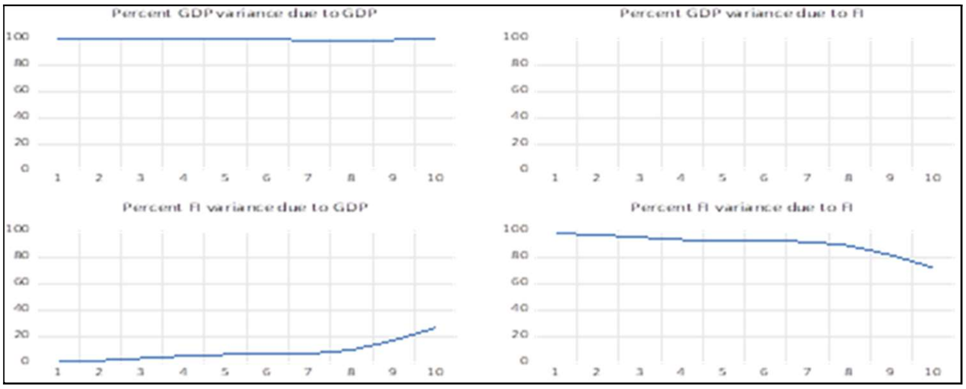

Figure 4. Variance analysis results

Source: own development.

Figure 4 shows that:

- The shocks effectively contribute to the GDP by explaining the variance of the FinTech investments in the long term more than in the short term. Furthermore, any sudden changes (shocks) in the GDP will affect FinTech investments.
- They also contribute effectively to the variance of FinTech investments by explaining the variance of the GDP in the long term more than in the short term. Furthermore, any sudden changes (shocks) in FinTech investments will affect the GDP.

4. THE RESULTS OF THE ECONOMETRIC STUDY

Based on standard modeling, time series stability testing, and the degree of integration of the variables, we see that:

- Both series (GDP) and (FI) are complementary with the same degree I (1). Based on the results of the test of delays, AIC, and SC criteria, the optimal number of delays for the study variables is 2.
- Based on the results of Granger Causality Test, there is no two-way causal correlation between GDP and FinTech investments in the short term. In addition, after the co-integration test, there were two complementary relationships between the study variables. This allows us to apply the causality test to know the direction of the long-term relationship and the impact between the variables.
- Through the LM Test, the estimated model is free from the problem of self-correlation of errors (the residuals are not self-related).
- After conducting the validity tests of the ECM model, the estimated model meets the conditions of stability and does not show problems of non-heterogeneity or self-association.
- After the significance test, the Coint Eq error is negative (0.73348) and significant at 5%; this is explained by a long-term balance between the variables in question.
- The results of WALD test (short-term significance) show that FinTech investments have no parameters in the GDP.
- After analysis of the functions of the response to the random shocks, the degree of response of both variables has achieved since the first period. Moreover, any sudden

shock with a standard deviation at 01 on the financial technology investment (FI) positively affects the GDP.
- The analysis of the variance test shows that the shocks effectively contribute to the GDP through explaining FinTech investments. In addition, any single structural shock of 1% in FinTech investments has a positive impact on the GDP.

5. CONCLUSION

The FinTech sector is rapidly growing all over the world. It offers a range of modern technologies and provides financial services and products, including innovative and sophisticated practices designed to provide new or existing financial products and services that will stimulate the financial development and the economic growth. This paper was an econometric study of the impact of FinTech investments around the world's economic growth during 2004–2023. It used the ECM and focused on a range of variables, namely, FinTech investments (FI) and GDP. According to the results obtained:

- The results of the causality test show that there is no causal link between the FinTech investments and the short-term economic growth. This disconfirms the first hypothesis.
- The test of random shock response functions and the variance analysis show a positive effect between FinTech investments and the economic growth rates. This confirms the second hypothesis.

Based on the results of our study, there are some recommendations and suggestions for future research:

Recommendations and suggestions:

- In order to enhance the world's FinTech, we need financial education initiatives (known as digital literacy), consumer protection measures to build trust in digital systems, and many initiatives to reduce the digital knowledge gap.
- Government agencies must provide the necessary support to stimulate the growth of the FinTech sector and develop flexible legal and legislative frame works that are clear and transparent.
- It is necessary to take advantage of each other's experiences in digital solutions, mainly after COVID-19 that led to developing programs and policies to mainstream digital FinTech services.

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THE DIMENSIONS OF ELECTRONIC (E)-BANKING SERVICE QUALITY ON CUSTOMER SATISFACTION: EVIDENCE FROM NIGERIA

This study investigates the dimensions of electronic (e)-banking service quality on customer satisfaction. The data were collected among bank customers within Lagos State, Nigeria vis a vis a validated closed-ended questionnaire from a sample of three hundred and eighty-three (383) questionnaires were returned. Descriptive analysis and regression analysis were used to analyse the data collected and test the study hypothesis. The results of this study revealed that ease to use, reliability and security have a positive significant impact on customer satisfaction. This shows that customers will be satisfied and be willing to use e-banking platform if it is easy to use, reliable and there is privacy for the financial transactions. The findings of this study has significantly contributed to academics and practitioners in the area of behavioral finance and likewise understand the need of different segment of customers of financial institutions.

Keywords: electronic (e)-banking, customers, customer satisfaction, service quality.

1. INTRODUCTION

The 21st-century banking sector operates within intricate and competitive environments as evidenced by evolving circumstances and a vast financial market. The pivotal role played by banks in the economic progress of any nation is undeniable due to their financial intermediation role and other services that are delivered electronically. This shows that banking of the 21st-century are encountering swift transformations due to the ingenuity and continually evolving electronic services in the financial market (Alkhowaiter, 2020; Ogare, 2013). Interestingly, the accessibility to technological progress has heightened individuals' awareness of global occurrences at their fingertips (Alkhowaiter 2020; Amin 2016). The electronic mechanism like electronic funds transfer

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(EFT), point of sale (POS) systems, mobile wallets, agency banking, automated teller machines (ATMs), mobile banking, internet banking etc. assumes a crucial function in this context, serving as a medium for connectivity, knowledge dissemination, shopping, entertainment and most importantly, accessing online financial services delivery (Tseng, Wei, 2020; Zheng et al., 2019).

Interestingly, one of the benefits banks derive from electronic banking products and services delivery is improved efficiency and effectiveness of their operations so that more transactions can be processed faster and most conveniently, which will undoubtedly impact significantly on the overall returns (Isa-Olatinwo, Uwaleke, Ibrahim, 2022; Dong, Yin, Liu, Hu, Li, Liu, 2020; Asiyanbi, Ishola, 2018). Whereas on the other hand, the customers enjoy several benefits but not limited to quick convenience, service delivery, enhanced security, reduced frequency of going to banks physically and reduced cash handling, minimization of transaction cost, timesaving, instant notifications and alerts etc. (Raji, Zamani, 2021; Haadi, Ajibola, 2018; Jenevive, Anyanwaokoro 2017). However, this technological advancement has also unveiled a "dark side" that has negatively impacted many users. A significant issue is the increased vulnerability to cyber fraud and identity theft. Cybercriminals exploit weaknesses in security systems, leading to unauthorized access to customers' accounts and personal information. According to the Nigerian Inter-Bank Settlement System (NIBSS), there was a reported increase in e-fraud cases, with over 46,000 incidents in 2020 alone, resulting in substantial financial losses for customers (NIBSS, 2020). These incidents have not only led to direct financial losses but have also eroded trust in electronic banking systems, making customers wary of utilizing these services despite their convenience (Islam, 2021). The study of Nwarize (2023) further buttress trust deficit as submitted that about 70% of bank customer's express concerns over the safety of their personal data when using electronic banking services.

Another major concern is the frequent technical glitches and downtimes experienced by electronic banking platforms. Customers often face difficulties in accessing their accounts, completing transactions, or resolving issues promptly due to system failures or maintenance activities. A study by Bamidele (2021) revealed that over 30% of electronic banking users in Nigeria reported experiencing service interruptions at least once a month, which significantly disrupted their financial activities (Bamidele, 2021). The Central Bank of Nigeria (CBN) also acknowledged in its 2020 annual report that frequent downtimes in banking systems are a critical issue affecting service delivery (CBN, 2020). Moreover, the lack of responsive customer service exacerbates these frustrations, leaving customers feeling helpless and dissatisfied. Mathew., Jose and Chacko (2020) found that poor customer service response times were a common complaint among electronic banking users, with many customers reporting delayed resolutions to their issues.

Consequently, while electronic banking offers numerous advantages, these dark side experiences highlight the need for banks to enhance their cybersecurity measures and improve the reliability and user support of their digital platforms to maintain customer trust and satisfaction (Al-Khalaf, Choe, 2020; Choudhury, 2013). Therefore, this study tends to examine dimensions of electronic (e)-banking service quality in terms of ease of use, reliability and security on customer satisfaction. The remaining part of the paper is organized as follows. Section two includes a literature review. Section three describes the methodology proposed for this empirical research. section four discussion of findings and finally, Section five discusses the main conclusions and recommendation

2. THEORETICAL AND LITERATURE REVIEW

This study was hinged on technology acceptance model (TAM) propounded by Fred Davis in 1989. The model submitted that individuals accept and use new technologies is subjected to two major factors i.e. perceived usefulness and perceived ease of use. Perceived usefulness enhance productivity and enhance performance as a result of application of technology and whereas perceived ease of use is of the opinion that technology will be convenient and easy to use. Nevertheless, this theory seems to be oversimplified Venkatesh, Morris, Davis, and Davis (2003). The electronic payment system and customer satisfaction in the Nigerian banking system was assessed by Chukwu, Chimarume and Ezeaku in 2021. In order to gather primary data, questionnaires were distributed to 70 bank customers in Akwa, Anambra State. The data were evaluated using the paired sample t-test and the descriptive methodology. The selected electronic payments included point-of-sale and ATM technologies. The findings showed that customers' actual experiences significantly fell short of expectations in all e-payment systems. However, as the study only looked at two of the many various types of electronic payment systems, this finding cannot be accepted.

The relationship between electronic payment methods and customer retention in banks was examined by Odusina, and Onakoya (2017). Using this study technique, a few Nigerian banks were selected and contrasted based on their track records in the industry, degree of competition, and ICT compliance. A questionnaire was also developed to collect data on the EPS grey area, customer retention, and bank entrepreneurial growth. In total, 200 persons responded to the survey. The relationship between the electronic payment system and customer retention was demonstrated to be favorable and significant after the findings were evaluated using SPSS. In addition to the lack of sufficient detail in the methodology, the study's conclusions may not be applicable to the overall population due to the study's small sample size.

Haadi, and Ajibola (2018) investigated the effects of E-banking services on customer satisfaction at a few chosen bank branches in Oyo State's capital city of Ibadan. The study's methodology included cross-sectional survey design and sample methods. The study used Pearson correlation as its analysis approach. The findings showed that electronic banking products, such as internet banking (85%), ATMs (98%), and electronic transfers (97%), were widely used. Constraints include things like faulty internet networks, bank fraud, and financial losses brought on by failed electronic transactions. Customers prefer e-banking due to its cashless nature, accessibility of cash, time savings from bank trips, and simple transactions. This result, however, cannot be accepted because a sample size of 100 does not adequately represent the study's population. Grace, and Oyinlola (2017) conducted research on the effect of financial technology services on bank customers' happiness in Nigeria. The study included 243 college students who correctly answered a standardized questionnaire. The statistical package for social science (SPSS) was used for data analysis and presentation. The report claims that the availability of financial technology services, how those services are run, and business processes all have an impact on client satisfaction with banks. But additional research is required, and it should not only rely on data collected from college students but also from other bank clients.

Simon, and Thomas (2016) investigated how electronic banking affected customer satisfaction in a few Kenyan commercial banks. The study made use of a structural questionnaire, sampling techniques, and a descriptive research design. Simple regression is the mode of analysis used. The final product showed how user-friendly and customersatisfying online banking, automated teller machines, and mobile banking were. Despite the fact that this study did not compare its results to any earlier research. Raji, and Zamani (2021) also examined into how electronic banking affected consumer satisfaction in Nigeria's Kwara state. Primary survey-based data were employed in the study, and correlation and regression analysis were performed to further analyze them. The correlation study revealed a positive relationship between each independent variable and customer satisfaction. The results of the regression analysis showed that security, transactional speed, usability, reliability, and responsiveness had a significant and positive impact on customer satisfaction. The study, however, ought to have treated e-payment services, such as ATMs, Internet banking, mobile banking, and POS, as independent variables.

Additionally, Muhammad, Yusuf, and Shuaibu (2022) investigated how financial technology affected deposit money banks in Nigeria's delivery of financial services. The study uses secondary data obtained from annual reports and accounts of listed deposit money banks on the Nigerian Stock Exchange. The study's method of analysis used descriptive statistics for correlation and regression. The findings showed that the financial services offered by Nigeria's listed deposit money banks are strongly impacted by POS and mobile banking. Isibor, Omankhanlen, Okoye, Achugamonu, Adebayo, Afolabi, and Ayodeji (2018) also studied how electronic banking technology affects consumer satisfaction and economic growth in Nigeria. The study used questionnaires to gather primary data from 100 participants. Following data analysis with the SPSS Statistical Package, the pair sample t-test was used to evaluate the acquired data. E-banking has improved customer satisfaction and strengthened Nigeria's economy, claims the poll.

Nnamani, and Makwe (2019) evaluated how customer satisfaction was affected by electronic payments. Both primary and secondary data sources were employed in this investigation. The CBN electronic banking guideline, GTB plc.'s annual report, and the CBN annual report were utilized to obtain secondary data, while questionnaires were employed to collect the main data. The statistical mean scores from the surveys were used to evaluate the data, and the chi-square test was used to determine the significance of the responses. The results of the survey revealed that the adoption of electronic banking products and services has significantly increased consumer satisfaction. Similar research was conducted by Nwekpa, Djobissie, Chukwuma, and Ezezue (2020) using the case study of Nigeria's Fidelity Bank PLC to examine how electronic banking affects customer satisfaction. The study used a survey research approach with a sample size of 41 individuals. The Pearson product moment correlation analysis was used to test the theory. The findings demonstrated that customer satisfaction is significantly impacted by Fidelity Bank PLC's online credit card payment systems. However, the study's sample size was too small for the results to be accepted.

Offei, and Nuamah-Gyambrah (2016) assessed how electronic banking affects customer satisfaction using a case study of GCB bank limited Koforidua. Data was gathered by questionnaires, and descriptive analysis was utilized to examine it. It was found that, despite the bank's use of the service, customers weren't completely utilizing internet banking because it was quite pricey to use. Despite this, no theory was applied in this study's research. Hamid, Alabsy, and Mukhtar (2018) examined the impact of electronic banking services on customer satisfaction in the Sudanese banking sector. The primary data for the study were gathered via a questionnaire. The data that was gathered was also examined using descriptive analysis. The analysis finds that there are statistically significant differences in consumer satisfaction levels with the electronic services provided by Sudanese banks. It also showed how internet banking services have a favorable impact on consumer satisfaction. Although there is a theoretical gap in this research, no theory was criticized in this investigation.

Junejo, Asif Ali Shah, and Bachani evaluated the effect of fintech on client satisfaction, an empirical data from the Allied Bank of Pakistan (2019). The primary research tool used was a questionnaire. The data was examined using factor analysis, regression analysis, and multiple regression analysis. The analysis's results showed that customer satisfaction was positively and significantly impacted by safety, dependability, and service security. Ijeoma, Akujor, and Mbah (2020) studied how customer satisfaction in commercial banks in Imo State was impacted by electronic banking. A questionnaire served as the main data gathering technique and provided the study's core data. The statistical method of choice for the investigation was the Pearson Product Moment Correlation Techniques. The results demonstrated a strong correlation between electronic banking and customer satisfaction for United Bank for Africa Plc, Access Bank Ltd, and Keystone Bank Ltd. It also shown a strong correlation between the use of mobile banking and automated teller machines at United Bank for Africa Plc, Access Bank Ltd, and Keystone Bank Ltd. Additionally, the student demonstrates a bad correlation between point of sale and customer satisfaction in certain banks.

Hindu, Onyeukwu, and Osuagwu (2018) examined E-banking, client satisfaction, and service quality. A total of 66895 clients were present, and 398 replies were picked at random. Both formal surveys and interviews were used to collect the data. The data that was gathered was analyzed using descriptive statistics. The research showed a strong correlation between excellent customer service and customer satisfaction. There was not enough literature review in this investigation. Jenevive, and Anyanwaokoro (2017) conducted research on the effect of electronic payment methods (EPM) on the profitability of commercial banks in Nigeria. The data source was secondary data. Data were acquired from the five banks included in the study's Annual Reports and Statements of Accounts, as well as the Central Bank of Nigeria's (CBN) Statistical Bulletin. This study has found that automated teller machines (ATMs) and mobile phone payments have a significant impact on the profitability of Nigeria's commercial banks. On the other hand, point of sale (POS) seems to have little to no effect on the banks' profitability.

3. METHODOLOGY

This study used descriptive survey research on other to understand and describe the existing conditions or variables that is being investigated and likewise assist the researcher to have contact relationship with the respondents to accurate information. Sekaran, and Bougie (2016) submitted that descriptive survey design allows the collection of data through the distribution of questionnaire to some selected respondent and also assist to give a lucid explanation of the variable of enquiry in the research process (Saunders, Lewis, and Thornhill, 2018). The study used purposive and convenience sampling technique and therefore selected Ikeja local government are of Lagos State. The study area was chosen because it is the state capital and commercial hub of Lagos state, and it enabled the researcher to have a proper coverage and gathering of information needed from the respondents of study. Hence, the population of this study included three- hundred and thirteen thousand, three hundred and thirty-three (313,333). The sample was drawn from the population of the study using Taro Yamane formula technique. However, the total number of respondents for the purpose of this study was three hundred and ninety-nine (399) questionnaires distributed to respondents in the selected local government area in

Lagos State. The size was considered sufficiently large enough to carry adequate estimation of the study. Three hundred and ninety-nine (399) copies of questionnaires were administered out to the respondents but only three hundred and eighty-three (383) questionnaires were returned.

Therefore, a total number of three hundred and eighty-three (383) returned questionnaires were valid instruments for this study. The research instrument used for this study is a questionnaire designed by the researcher. The questionnaire is divided into two sections. The first section seeks to obtain the demographic information of the respondents while the second section contains items relating to the objectives set out from the chapter one of this study. In addition, to assess the validity of the questionnaire, this study conducted a face and content test before administering the questionnaire to respondents, whereas reliability was achieved through a split halve method. Cronbach Alpha was used to ascertain the questionnaire reliability which revealed a coefficient alpha of 0.8765 suggesting that the study used a strong reliable instrument.

4. RESULT AND DISCUSSION

This study used analytical techniques to analyze data collected from different respondent with simple percentage analysis.

Table 1. Descriptive Statistics of the Data

Demographic	Frequency	Percentage
Age		
18–24 years	202	52.7
25–34 yrs	71	18.5
35–44 yrs	12	3.1
46 and above	8	2.1
Total	383	100
Marital Status		
Single	223	58.2
Married	87	22.7
Divorced	73	19.1
Total	383	100
Educational Qualification		
Primary Education	110	28.7
Secondary Education	71	18.5
Technical Education	40	10.4
First Degree	127	33.2
Postgraduate	35	9.1
Total	383	100

Sources: (Field Survey, 2024).

Table 1 shows demographic characteristics of respondent in terms of age, educational qualification and marital status. The age respondent indicated that 18–24 yrs has a frequency of 202 with a percentage of 52.7%. 25–34 yrs has a frequency of 155 with a percentage of 40.5%. 35–44 yrs has a frequency of 12 with a percentage of 3.7%. The age section indicated that age bracket of 18–24 filled the questionnaire the most among other age group.

The educational qualification shows that primary education has a frequency of 71 with a percentage of 18.5%. Secondary education has a frequency of 110 with a percentage of 28.7%. Technical education has a frequency of 40 with a percentage of 10.4%. Postgraduate has a frequency of 35 with a percentage of 9.1%. First degree has a frequency of 127 with a percentage of 33.2%. The educational qualification that have embraced the electronic banking is the first-degree holders.

The marital status shows that single has a frequency of 223 with a percentage of 58.2%. Married has a frequency of 87 with a percentage of 22.7%. Divorced has a frequency of 73 with a percentage of 19.1. The single respondent are the bracket that have embraced the electronic banking in Nigeria.

Table 2. Ease of Use in Electronic (E)-Banking Service Quality

S/N	Research Statements	Mean	SD	SA	A	D	SD	UD	Total
1	Does the navigation on the e-banking platform allow users to easily find the services and information they need without extensive searching or multiple clicks	1.82	0.78	185 (48.3)	190 (49.6)	4 (1.0)	4 (1.0)	0 (0.0)	383 (100)
2	Do the instructions and prompts clear and easy to understand?	2.28	1.37	154 (40.7)	138 (36.0)	89 (23.2)	00 (00)	00 (0.0)	383 (100)
3	Do customers find the process efficient and free of unnecessary steps or delays?	2.67	1.50	127 (33.2)	155 (40.5)	21 (5.5)	23 (6.0)	57 (14.9)	383 (100)
4	Do customers experien-ce a seamless user experience regardless of the device they are using?	1.88	1.20	111 (29.0)	107 (27.9)	35 (9.1)	54 (14.1)	76 (19.8)	383 (100)
5	Do customers encoun-ter any difficulties in creating an account, setting up security fea-tures, or logging in to their accounts?	1.86	1.10	239 (62.4)	2 (5)	101 (26.4)	29 (7.9)	12 (3.1)	383 (100)

Sources: (Field Survey, 2024).

A total of 185 participants, constituting 48.3%, strongly concur with the assertion in Q1. Similarly, 190 respondents, representing 49.6%, agree with the statement in Q1. On the other hand, 4 participants, making up 1.0%, express disagreement with the statement in Q1. Furthermore, 4 respondents, accounting for 1.0%, strongly disagree with the statement in Q1, while none of the participants remain undecided on the matter. In the case of Q2, 154 participants, equivalent to 40.7%, strongly agree with the statement. Additionally, 138 respondents, comprising 36.0%, agree with the assertion in Q2. Conversely, 89 participants, representing 23.2%, disagree with the statement in Q2. Moreover, none of the respondents strongly disagree with the statement in Q2, and none are undecided on the issue.

Regarding Q3, 127 participants, amounting to 33.2%, strongly agree with the statement. Likewise, 155 respondents, making up 40.5%, agree with the statement in Q3. Meanwhile, 21 participants, accounting for 5.5%, express disagreement with the statement in Q3. Furthermore, 23 respondents, representing 6.0%, strongly disagree with the statement in Q3, while 57 participants, constituting 14.9%, remain undecided on the matter. In the context of Q4, 111 participants, equivalent to 29.0%, strongly agree with the statement. Additionally, 107 respondents, comprising 27.9%, agree with the assertion in Q4. On the other hand, 35 participants, representing 9.1%, disagree with the statement in Q4. Moreover, 54 respondents, accounting for 14.1%, strongly disagree with the statement in Q4, while 76 participants, making up 19.8%, remain undecided on the issue.

Furthermore, 239 participants, constituting 62.4%, strongly agree with the statement in Q5. Moreover, 2 respondents, representing 5%, agree with the assertion in Q5. Conversely, 101 participants, making up 26.4%, express disagreement with the statement in Q5. Additionally, 29 respondents, comprising 7.9%, strongly disagree with the statement in Q5, while 12 participants, accounting for 3.1%, remain undecided on the matter.

Table 3. Reliability of Electronic (E)-Banking Service Quality

S/N	Research Statements	Mean	SD	SA	A	D	SD	UD	Total
1	Do customers experience frequent errors or inaccuracies when conducting transactions?	1.46	1.05	13 (3.4)	60 (15.7)	18 (4.7)	278 (72.6)	14 (3.7)	383 (100)
2	Does the e-banking service provide uninterrupted access to account information and transaction capabilities?	1.59	0.78	311 (81.2)	19 (5.0)	11 (2.9)	32 (8.4)	10 (2.6)	383 (100)
3	Are transactions completed within the expected time frames consistently?	2.99	1.66	202 (52.7)	155 (40.5)	12 (3.1)	8 (2.1)	6 (1.6)	383 (100)
4	Are transaction confirmations and receipts provided promptly and accurately after each transaction?	1.86	1.10	110 (28.7)	71 (18.5)	40 (10.4)	35 (9.1)	127 (33.2)	383 (100)
5	Do customers find that their account balances and transaction histories are updated in real-time without delays or discrepancies?	1.59	0.78	169 (44.1)	38 (9.9)	117 (30.4)	58 (15.1)	0 (0)	383 (100)

Sources: (Field Survey, 2024).

278 respondents, constituting 3.4%, strongly concur with the assertion presented in Q6. Moreover, 60 respondents, representing 15.7%, express agreement with the statement in Q6. On the contrary, 18 respondents, amounting to 4.7%, hold a dissenting view regarding the statement in Q6. In addition, 13 respondents, comprising 72.6%, strongly oppose the statement in Q6, while 14 respondents, accounting for 3.7%, remain undecided on the matter. 311 respondents, equivalent to 81.2%, firmly agree with the statement provided in Q7. Similarly, 19 respondents, making up 5.0%, support the statement in Q7. Conversely, 11 respondents, totaling 2.9%, express disagreement with the statement in Q7. Furthermore, 32 respondents, representing 8.4%, strongly disagree with the statement in Q7, whereas 10 respondents, constituting 2.6%, remain indecisive about the matter.

202 respondents, amounting to 52.7%, strongly agree with the assertion outlined in Q8. Additionally, 155 respondents, making up 40.5%, concur with the statement in Q8. Conversely, 12 respondents, accounting for 3.1%, disagree with the statement in Q8. Moreover, 8 respondents, comprising 2.1%, strongly oppose the statement in Q8, while 6 respondents, representing 1.6%, are undecided on the issue. 110 respondents, representing 28.7%, strongly agree with the statement articulated in Q9. Furthermore, 71 respondents, constituting 18.5%, express agreement with the statement in Q9. On the other hand, 40 respondents, making up 10.4%, disagree with the statement in Q9. Moreover, 35 respondents, amounting to 9.1%, strongly disagree with the statement in Q9, while 127 respondents, accounting for 33.2%, remain undecided on the matter.

169 respondents, equivalent to 44.1%, strongly agree with the assertion made in Q10. Similarly, 38 respondents, totaling 9.9%, agree with the statement in Q10. Conversely, 117 respondents, comprising 30.4%, disagree with the statement in Q10. Additionally, 58 respondents, making up 15.1%, strongly oppose the statement in Q10, while 0 respondents, representing 0%, are undecided on the matter.

202 participants, constituting 52.7%, express strong agreement with the assertion made in Q11. Furthermore, 155 participants, representing 40.5%, concur with the statement in Q11. A total of 12 participants, equivalent to 3.1%, hold a contrary opinion to the statement in Q11. Moreover, 8 participants, amounting to 2.1%, express strong disagreement with the statement in Q11, whereas 6 participants, making up 2.0%, remain undecided regarding the statement in Q11. 272 respondents, making up 71.0%, strongly agree with the statement presented in Q12. Additionally, 96 respondents, representing 25.1%, express agreement with the statement in Q12. A minority of 4 respondents, accounting for 1.0%, disagree with the statement in Q12. Furthermore, 6 respondents, constituting 1.6%, strongly disagree with the assertion in Q12, while 5 respondents, amounting to 1.3%, are undecided about the statement in Q12.

In the case of Q13, 278 respondents, comprising 72.6%, strongly agree with the statement. Similarly, 60 respondents, making up 15.7%, express agreement with the statement in Q13. On the contrary, 18 respondents, accounting for 4.7%, disagree with the assertion in Q13. Moreover, 13 respondents, representing 3.4%, strongly disagree with the statement in Q13, while 14 respondents, equivalent to 3.7%, are undecided regarding the statement in Q13. Regarding Q14, 311 respondents, constituting 81.2%, strongly agree with the statement. Conversely, 19 respondents, representing 5.0%, express agreement with the statement in Q14. A total of 11 respondents, making up 2.9%, disagree with the assertion in Q14. Additionally, 32 respondents, amounting to 8.4%, strongly disagree with the statement in Q14, while 10 respondents, comprising 2.6%, remain undecided about the statement in Q14.

Table 4. Security of Electronic (E)-Banking Service Quality

S/N	Research Statements	Mean	SD	SA	A	D	SD	UD	Total
1	Does the implementation of advanced encryption technologies impact the perceived security of electronic banking services among customers?	1.49	0.99	202 (52.7)	155 (40.5)	12 (3.1)	8 (2.1)	6 (2.0)	383 (100)
2	Does customer trust in the security of E-banking services influence their overall satisfaction with service quality?	1.46	1.05	272 (71.0)	96 (25.1)	4 (1.0)	6 (1.6)	5 (1.3)	383 (100)
3	Does the use of two-factor authentication effectively prevent unauthorized access to E-banking accounts?	1.59	0.78	278 (72.6)	60 (15.7)	18 (4.7)	13 (3.4)	14 (3.7)	383 (100)
4	Does the presence of robust security measures in E-banking platforms mitigate common security challenges faced by banks?	2.99	1.66	311 (81.2)	19 (5.0)	11 (2.9)	32 (8.4)	10 (2.6)	383 (100)
5	Does regulatory compliance and adherence to security standards enhance the perceived quality and security of electronic banking services among users?	1.45	2.34	202 (52.7)	155 (40.5)	12 (3.1)	8 (2.1)	6 (1.6)	383 (100)

Sources: (Field Survey, 2024).

202 respondents, representing 52.7%, strongly agree with the statement in Q15. Furthermore, 155 respondents, constituting 40.5%, express agreement with the statement in Q15. A total of 12 respondents, making up 3.1%, disagree with the assertion in Q15. Moreover, 8 respondents, equivalent to 2.1%, strongly disagree with the statement in Q15, while 6 respondents, accounting for 1.6%, remain undecided regarding the statement in Q15.

4.1. Hypotheses Testing

H01: Ease of use in electronic (e)-banking has no significant effect on service quality

Table 5. Hypothesis Testing Results on Impact of Ease of Use in E-Banking on Service Quality

Variable	Co-efficient	Std-Error	t-stat	P-value
Constant	5.361	0.587	9.138	0.000
Ease of use	0.545	0.047	11.644	0.000
R^2	0.563	**F.cal**		135.575
Adj. R^2	0.561	**Sig.F**		0.000

Source: (Researcher's Survey Field, 2024).

The table 5 demonstrates that ease of use has a significantly positive impact on service quality, with a coefficient of β1= 0.545 and a p-value less than 0.05. The table also shows that the overall model is statistically significant at the 5% level, as indicated by an F-calculated value of 135.965 with a p-value less than 0.05. The R-squared value, which measures the goodness of fit for the regression model, indicates that the independent variable (ease of use) accounts for 56.3% ($R^2 = 0.563$) of the variation in the dependent variable (service quality). If another variable were added, the model would still explain 56.1% ($R^2 = 0.561$) of the variation.

H02: Reliability in electronic (e)-banking has no significant effect on service quality

Table 6. Hypothesis Testing Results: Effect of Reliability in E-Banking on Service Quality

Variable	Co-efficient	Std-Error	t-stat	P-value
Constant	8.841	0.321	27.562	0.000
Reliability	0.480	0.026	10.668	0.000
R^2	0.530	**F.cal**		418.138
Adj. R^2	0.528	**Sig.F**		113.813

Source: (Researcher's Survey Field, 2023).

Table 6 shows that reliability has a significantly positive impact on service quality, with a coefficient of β1= 0.480 and a p-value less than 0.05. However, the overall model is statistically insignificant at the 5% level, as indicated by an F-calculated value of 418.138 with a p-value greater than 0.05. The R-squared value, which measures the goodness of fit for the regression model, indicates that the independent variable (reliability) accounts for 53.0% ($R^2 = 0.530$) of the variation in the dependent variable (service quality). If another variable were added, the model would still explain 52.8% ($R^2 = 0.528$) of the variation.

H03: Security of electronic (e)-banking has no significant effect on service quality

Table 7. Hypothesis Testing Results: Effect of Security in E-Banking on Service Quality

Variable	Co-efficient	Std-Error	t-stat	P-value
Constant	10.458	0.386	27.097	0.000
Security	0.156	0.035	4.423	0.000
R^2	0.549	**F.cal**		19.567
Adj. R^2	0.546	**Sig.F**		0.000

Source: (Researcher's Survey Field, 2024).

Table 7 indicates that security has a significantly positive effect on service quality, with a coefficient of $\beta 1 = 0.156$ and a p-value less than 0.05. The table also shows that the overall model is statistically insignificant at the 5% level, as evidenced by an F-calculated value of 19.567 and a p-value less than 0.05. The R-squared value, which measures the goodness of fit for the regression model, reveals that the independent variable (security) accounts for 54.9% ($R^2 = 0.549$) of the variation in the dependent variable (service quality). If another variable were added, the model would still explain 54.9% ($R^2 = 0.549$) of the variation.

4.2. Discussion of Findings

Findings from hypothesis one, it was revealed that ease of use has positive significant effect on service quality of electronic banking. This suggested that ease to use of electronic banking platform by bank customers enhance service quality provided by the bank. This finding align with technology acceptance model and the study of (Ahmad, Bhatti, and Hwang, 2020; Khrais, 2018; Firdous, and Farooqi, 2017) who have earlier argued that ease to use are major factors that determine attitude of customer towards using e-banking and likewise behavioral intentions to use e-banking. The second hypothesis further revealed that customer reliability on e-banking has positive significant effect on service quality. This suggested that reliable e-banking services platform enhance customer satisfaction and service quality perceptions. Therefore, this shows that banks should continue to provide high quality service to their customers which will assist them to build stronger customer relationships. This finding align with the study of Beshir and Zelalem, 2020; Hammoud, and Bizri, El Baba, 2018) and contrarily to the findings of Sharma, Singh, J., and Singh, A., 2020).

In addition, the third hypothesis revealed that adequate security of e-banking platform has positive significant effect on service quality. This suggest that safeguarding customer's financial transactions and other financial data enhance customer confidence and the overall positive experience with the service providers. This finding align with the study of Sharma, Singh, J., Singh, A., 2020; Ali and Omar, 2016).

5. CONCLUSIONS AND RECOMMENDATIONS

This study aimed to examine the impact of E-Banking service quality on customer satisfaction in the Nigeria banking sector. Interestingly, previous studies had been done in developed and developing markets based on the literature reviewed. The study used qualitative approach by administering questionnaire among the customers of different banks. Findings shows that the three hypotheses in this study were supported by the data, and the main contribution of this study was that ease to use, reliability and security as a service quality variable, was the main predictor of customer satisfaction in this E-Banking services in Nigeria. The findings of this study will contribute to a better understanding of what and how Nigerian banks may leverage advancements in information technologies to develop financial innovational services that would meet the expectations of Nigerian customers.

Based on the findings of this study, following recommendations are made in order to enhance quality service delivery of e-banking in Nigeria deposit money banks: firstly, the management of the financial institutions should adopt more seamless technological innovation as a means of making electronic banking platform more user friendly especially when designing new product and regular usability testing. Secondly, Nigeria deposit money banks should design robust customer feedback machineries that can help banks to understand the need and address the challenges of customers in other to continuously improve their e-banking services.

Thirdly, Nigeria deposit money banks should prioritize and implement strong security measures. Through the adoption of stringent security protocols, financial institutions have the ability to instill confidence in clients and safeguard monetary transactions, consequently enhancing the general level of service. The presence of a secure platform serves to reassure customers regarding the safety of their confidential data, thereby cultivating a sense of trust in the utilization of electronic banking services. Lastly, Nigeria deposit money banks should engage in continuous training of bank employees regarding the most up-to-date e-banking advancements and strategies for customer service is identified as another crucial suggestion. Employees who are well-versed in these areas are able to provide enhanced assistance and direction to clients, thereby upholding superior service benchmarks and managing concerns efficiently. Therefore, these recommendations would assist Nigerian deposit money banks enhance the quality of e-banking services that can increased customer satisfaction and loyalty and also maximize shareholder wealth.

Suggestion for Further Studies

How gender and cultural differences influence perceptions of e-banking service quality and their impact on customer satisfaction.

Analyze how e-banking service quality contributes to customer satisfaction during crises, such as economic downturns, pandemics or cybersecurity breaches.

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