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Future-Proofing Islamic Finance: A Bibliometric Review of the Fintech Era

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Abstract
This study, entitled "Future-Proofing Islamic Finance: A Bibliometric Review of the Fintech Era," investigates the dynamic mix of Islamic finance and financial technology (Fintech) using advanced bibliometric analysis. By utilizing the VOS viewer from 2004 to 2023, a comprehensive review of 998 papers was conducted. The main keywords for this analysis are “Islamic finance,” “financial technology,” and “bibliometric analysis.” Methods: The VOS viewer facilitates comprehensive analysis of the data set, focusing on linkage patterns, publication trends, and influential journals in the realm of Islamic finance and Fintech. Key metrics such as publication growth, prolific authors, influential journals, and prolific countries are analyzed to provide an in-depth understanding of research trends. Results: Bibliometric analysis of 998 papers reveals emerging trends in Islamic finance and Fintech, emphasizing the significance of technology-driven growth in the Islamic finance landscape. This study identifies key research themes, collaborative networks, and important contributions that shape this domain. Research Limitations/Implications: This analysis is based on data extracted using the VOS viewer from 2004 to 2023 and may not cover the entirety of research in Islamic finance and Fintech. It provides a comprehensive yet specific look at trends in this intersection. Conclusions and Recommendations: This bibliometric review provides insight into the evolution of Islamic finance in the context of Fintech, highlighting research growth, influential authors, and key journals. It offers valuable insights for researchers, practitioners, and policymakers, paving the way for future research linking Islamic finance to technological innovation.

Keywords: Islamic Finance, Financial Technology, Bibliometric Analysis

1. Introduction

Islamic finance or Islamic finance is a financial system that operates in accordance with the principles of Islamic sharia, which prohibits usury (interest), speculation and activities with unclear risks. These principles require that financial transactions be based on fairness, sustainability and social responsibility. Islamic finance aims to promote financial inclusivity and encourage more responsible financial innovation.

In recent years, Islamic finance has attracted significant attention as an alternative to traditional finance, based on Sharia principles and values (Rabbani et al., 2020). Along with the increasing use of technology in the financial sector, Islamic finance has adapted and integrated financial technology (fintech) to be able to provide more efficient and accessible financial services for its consumers (Hassan et al., 2020).

Islamic finance, which is based on Sharia principles, can benefit from the application of Fintech technology. However, recent studies (Abu-Bakar, 2018; Abubakar, Ogunbado, & Saidi, 2018; Biancone, Secinaro, & Kamal, 2019; Todorof, 2018) have investigated programming issues related to Fintech-based solutions for the Islamic finance industry. Although there are views for and against Shariah compliance of Fintech products, the various applications of Fintech for the Islamic finance industry cannot be ignored. Elasrag (2019) has highlighted the use of smart contracts to ensure products or services from the Islamic finance industry comply with Sharia principles. The global Islamic Fintech market is estimated to reach $79 billion in transaction volume (2021) and is expected to grow by an average of 18% per year, to reach $179 billion in 2026. Likewise, the global Islamic Fintech market is expected to reach $79 billion in transaction volume in 2021. The top six OKI Fintech markets based on transaction volume for Islamic Fintech are Saudi Arabia, Iran, Malaysia, UAE, Turkey and Indonesia. Collectively, the top 6 markets account for 81% of the OIC Islamic Fintech market size, indicating the existence of two dominant regional hubs emerging among OIC countries for Islamic Fintech.

The GIFT Index ranks 64 countries in terms of conduciveness to Islamic Fintech, with Malaysia and Saudi Arabia as prominent jurisdictions, and Indonesia, the UAE and the UK rounding out the top five.

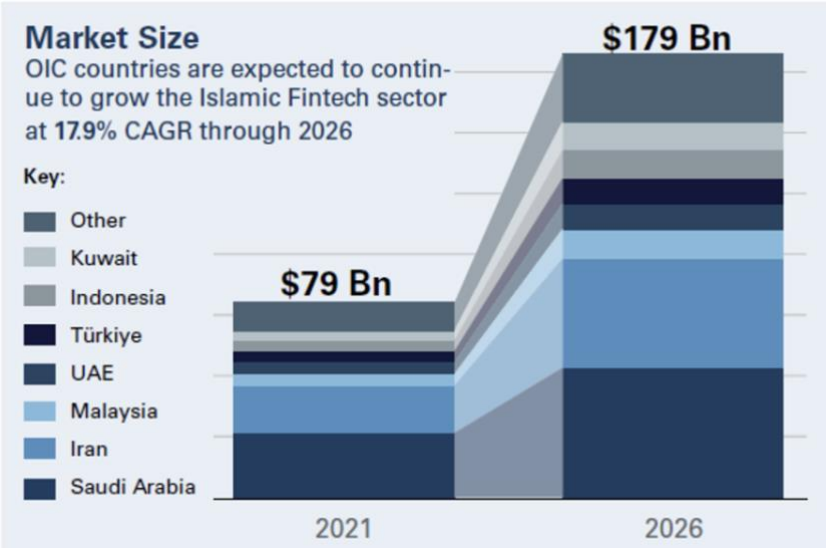

Figure 1: Market Size Fintech Islam Global

The GIFT Index ranks 64 country hubs based on conduciveness to Islamic Fintech, with Malaysia and Saudi Arabia standing out as leading jurisdictions, while Indonesia, the UAE and the UK also feature in the top five. The assessment was carried out using a total of 19 indicators divided into five different categories for each country. The five categories include Talent, Regulation, Infrastructure, Islamic Fintech Market & Ecosystem, and Capital. Weight is given to each category to produce an overall score, where the greatest weight is given to the Islamic Fintech Market & Ecosystem category, as this category specifically indicates a country's conduciveness to Islamic Fintech.

The GIFT Index assessment provides a deep understanding of the condition and potential of Islamic Fintech in various countries. The criteria considered include crucial aspects such as available talent, applied regulations, as well as infrastructure and capital that support the development of Islamic Fintech. The greater weighting in the Islamic Fintech Market & Ecosystem category shows the importance of an ecosystem that is conducive to growth and innovation in the Islamic Fintech industry. Thus, this assessment not only provides an overview of current

conditions, but also provides an outlook on potential future developments in the Islamic Fintech industry at a global level. As seen in the table below:

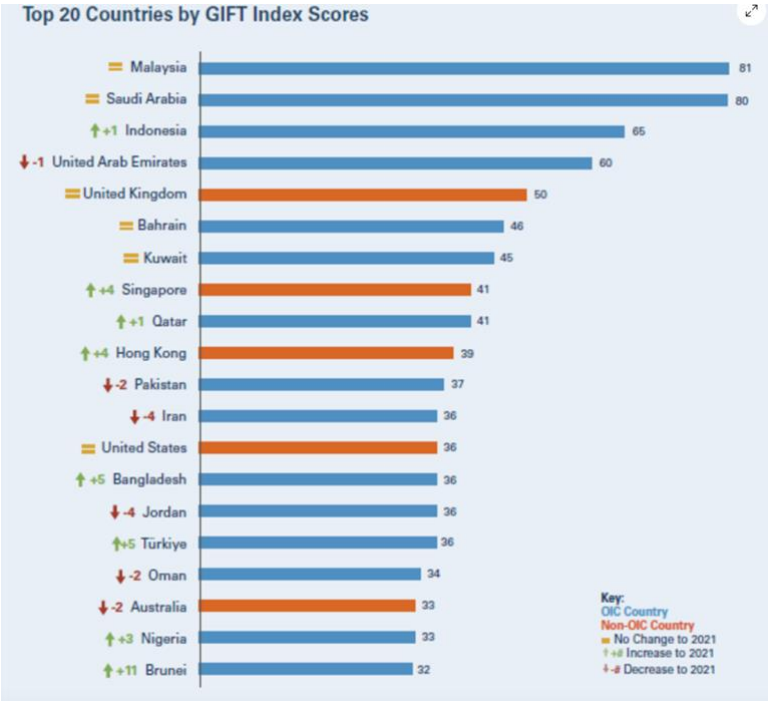

Figure 2: The Global Islamic Fintech (GIFT) Index

Furthermore, the iFinetch Hubs Maturity Matrix identifies countries such as Malaysia, UAE and Indonesia as Leader Hubs, indicating that these countries have a high level of maturity in developing the Fintech ecosystem. On the other hand, Saudi Arabia has moved from the Emerging to Leader category, marking significant progress in supporting Fintech. Meanwhile, countries such as Bahrain, Bangladesh, Egypt, Iran, Jordan, Kuwait, Nigeria, Oman, Pakistan, Qatar and Turkey, although experiencing maturity in Fintech development, show a lower level of conduciveness towards Sharia Fintech. Despite this, they are experiencing relatively high growth at the domestic level, indicating significant growth potential in terms of market size. This analysis provides in-depth insight into how these countries are developing in supporting the Fintech ecosystem, and reflects the challenges and opportunities faced in expanding Fintech penetration, especially in the sharia context. As seen in the following matrix:

Figure 3: iFinetch Hubs Maturity Matrix

The emergence and development of Fintech has opened up new opportunities and challenges for the Islamic finance industry, providing innovative solutions to traditional financial problems, but also raising new issues related to regulation and ethics. As a result, a growing body of literature evaluates the potential impact of Islamic Fintech on the financial sector and its clients, while seeking solutions to challenges and future growth prospects (Rabbani 2022; Kok et al. 2022).

However, there are several shortcomings in integrating technology with sharia financing. One potential weakness is the potential for financial exclusion, where those who do not have access or are unfamiliar with technology will be left behind. Additionally, there are challenges in ensuring that Fintech platforms comply with Sharia principles and laws, which can be complex and require close monitoring (Oseni and Ali 2019; Rabbani et al. 2022b). Furthermore, there are ethical questions regarding Fintech, such as the use of artificial intelligence in decision making and the potential for bias in algorithms (Antoniadi et al. 2021). Overall, the convergence of technology and Islamic finance offers various benefits, but also raises a number of issues that must be addressed through careful analysis and regulation.

In this research, carrying out a bibliometric evaluation of the literature, can help identify key topics and gaps in existing research on Islamic finance and fintech, revealing obstacles and potential for future growth and development. This study specifically sought to find the most cited authors, journals and publications on the topics of Islamic finance and fintech, as well as emerging and upcoming trends in this sector. Through the analysis of this study, we hope to contribute to a better understanding of the problems and potential of Islamic finance in the era of financial technology.

Alshater et al. (2021a) conducted a bibliometric study of articles in Scopus indexed journals to fill gaps in the literature on zakat. The analysis revealed key articles, citation patterns, and research objectives that will help guide future scholarly efforts in this field.

Additionally, Biancone et al. (2020) used bibliometric analysis to identify key topics such as banking, interest rates, comparison with traditional and portfolio banks, and governance and control structures after conducting a complete screening technique of all IBF-related publications. This study offers journal citation rates and impact factors as quantitative markers to predict future research trends in IBF.

Furthermore, Lada et al. (2023) contribute to this body of knowledge by completing a thorough literature review and bibliometric analysis to provide a systematic study of the relationship between Islamic economics and sustainability.

In contrast, Hassan et al. (2021) conducted a bibliometric analysis and determined Malaysia as the most relevant country, International Islamic University Malaysia (IIUM) as the most relevant institution, and International Journal of Systems and Ethics as the most relevant journal in the field of Islamic microfinance. They also highlight four key research issues and propose future research initiatives.

Likewise, Ahmed et al. (2022) recognized four main research issues in the field of blockchain technology in finance, namely blockchain applications in payment systems, cryptocurrencies, market and regulatory developments, and blockchain technology development.

The results of this research provide insight into the current level of blockchain technology research in finance, as well as ideas for future research in this area. In the era of financial technology, the study of Islamic finance is increasingly relevant as this business continues to develop and adapt to changes in technology and client expectations. This bibliometric review adds to the literature by highlighting key topics and trends at the intersection of Islamic finance and fintech, as well as the most cited authors, journals and publications.

The research also emphasizes new and future developments in the sector, such as the application of blockchain technology in Islamic finance, the potential of fintech to drive financial inclusion, and ethical issues related to the use of artificial intelligence in decision making. This study provides insight into the obstacles and potential for the

growth and development of Islamic finance in the era of financial technology by identifying patterns and gaps in the literature.

2. Literature Review

Islamic finance is a financial system that focuses on the quality and improvement of people's lives fairly, equal distribution of income, and social justice (Rabbani et al., 2021a; Shaikh et al., 2020). Islamic finance is different from other financial institutions because it applies Islamic law (Shariah) to products, services, transactions, and how they are presented to customers. For example, Islamic banks strictly avoid gambling and betting (alqimar), speculation or non-halal income (maysir), and excessive risk or uncertainty or fraud (gharar). Additionally, Sharia law prohibits the trade in alcohol, pork and illegal drugs. In addition, interest (riba) on deposits is not given in Islamic banks, and generally, Islamic banks invest in assets desired by customers by sharing the risks and profits obtained from the transaction. Thus, banks buy assets or products at a certain price and then sell them back to customers at a higher price (musharakah) (Todorof, 2018; Shaikh et al., 2020; Rabbani et al., 2020).

In addition, in some cases, the bank owns the asset or product completely, and the customer only receives ownership after payment in full is made, so that the asset is owned by the partnership (murabaha). Islamic banks have been in the market for more than thirty years. In Egypt, the first Islamic bank, Mit Ghamr Savings Bank, opened in 1963 (Todorof, 2018). However, the adoption of Islamic finance is relatively lower compared to conventional banks. Malaysia, the United Arab Emirates (UAE), Bahrain, the Kingdom of Saudi Arabia (KSA), and Oman are the leading world leaders in Islamic banks (Shaikh et al., 2020).

Four main factors drive the growth of Islamic banks: first, the Muslim population which reached 1.8 billion (2017) and is expected to reach 3 billion in 2060. Second, the young population of the Islamic world is characterized by a young age, with an average age of youth in the Islamic world is 24 years, while the average age of youth in the world is 32 years, so the youth of the Islamic world are more energetic and inclined towards technology, according to the 2015 report. Third, the volume of investment by Islamic banks in the Islamic economy (country -Islamic countries) reached 745 million dollars between 2015 and 2018. Fourth, there is significant trade in Islamic economy lifestyle products, with imports of 271.8 billion dollars and exports of 210.5 billion dollars (2017).

According to Todorof (2018), more than 90% of banks are expected to develop and implement mobile applications (m-bank). Banking service providers aim to increase customer satisfaction and engage them through mobile devices. FinTech investments reached 93 billion dollars in 2021. Banks use mobile technology to provide a variety of services to their customers, such as payments and remittances, lending and borrowing, investments, and insurance.

Fintech, as the latest innovation in the financial services industry, has significantly increased financial inclusion by reaching diverse customer groups. This innovative concept has also had a major impact on the Islamic finance sector. The emergence of Islamic Fintech has paved the way for the development of innovative products in accordance with Sharia principles, providing a competitive advantage to the Islamic finance sector. It is important to remember that Islamic Fintech differs from conventional Fintech due to Sharia compliance requirements. However, this has provided Islamic financial institutions (IFIs) with the opportunity to improve their infrastructure and product offerings (Jamil & Seman, 2019). As a result, research on the application of Fintech in the Islamic finance sector has experienced a significant increase in recent years (Abojeib & Habib, 2019; Biancone et al., 2019; Jamil & Seman, 2019).

Baber (2019) conducted a significant study on the impact of Fintech and crowdfunding on customer retention in Islamic banks in Malaysia and the United Arab Emirates. The study focused on Malaysia, which received the highest score in the Islamic Finance Country Index, and the United Arab Emirates, which is known for its largest market share in Islamic finance.

3. Research Methods

3.1. Types and Research Methods Used

This article uses a bibliometric approach to conduct a comprehensive literature review on the development of Islamic finance in the fintech era. A bibliometric approach is used to identify, collect and analyze information from related scientific articles published in trusted databases and journals. By utilizing this method, research can describe existing research trends, the main topics discussed, as well as the significant contributions of these articles in enriching understanding of Islamic finance and its impact on the financial industry as a whole.

This bibliometric analysis is carried out by selecting certain criteria for articles to be included in the literature review. These criteria may include year of publication, language, subject, and relevance to the research topic. Once suitable articles have been identified, bibliometric data such as number of citations, authorship frequency, and topic distribution patterns can be extracted and analyzed. Thus, this bibliometric method allows researchers to understand the Islamic finance research landscape in the context of the fintech era in a systematic and objective way.

This method uses scientific mapping tools to identify current trends and research gaps, as well as organizations, authors, sources, and countries that play an important role in data collection and analysis. The main goal of a scientific map is to identify the key elements of a scientific issue through analysis and visualization of a broad topic. The research is divided into several sections, including “Data Sources,” “Selection of Tools for Science Mapping,” and “Scientometric Techniques.”

3.2. Data source

Data for this research was obtained from two main sources, namely Publish or Perish and VOS Viewer. Publish or Perish is software used to extract and analyze data from scientific literature databases such as Google Scholar. By using Publish or Perish, researchers can identify articles related to Islamic finance and fintech that have been published in leading journals throughout the world. Additionally, the software allows researchers to evaluate the quality and impact of the articles by checking the citation counts and impact factors of the journals in which they were published.

In addition, bibliometric data was also analyzed using VOS Viewer, software used to visualize networks and relationships between keywords, authors and articles in a research field. By using VOS Viewer, researchers can map collaboration networks between authors, identify dominant topic clusters, and analyze the development of research trends over time. By utilizing the visual analysis capabilities of VOS Viewer, this research can provide a deeper understanding of the dynamics and research patterns in the fields of Islamic finance and fintech.

The combination of data from Publish or Perish and VOS Viewer provides a powerful framework for conducting a comprehensive literature review on Islamic finance in the fintech era. By utilizing these two data sources, this research can provide a comprehensive picture of research developments and trends in this field, as well as provide readers with valuable insight into the future direction of Islamic finance in the context of continuously developing financial technology.

3.3. Proses Bibliography

The aim of this bibliometric analysis is to provide a comprehensive overview of the research field, including its growth and impact, as well as to identify key authors, institutions and research topics that appear in the related literature (Donthu et al., 2021; Saniyyah & Nandiyanto, 2022). In this context, bibliometric analysis involves a series of steps consisting of identifying relevant literature sources, data collection, quantitative analysis, data visualization, and interpretation of results (see Figure 1) (Donthu et al., 2021; Saniyyah & Nandiyanto, 2022).

Figure 4: Five Steps of Bibliometric Analysis (Fahimnia et al., 2015; Muhammad et al., 2022)

Step 1. Defining Search Keywords

The first step in this research involved using Publish or Perish software to conduct a literature search in the Google Scholar database chosen for its high quality and quantity of literature. In January 2024, a literature search was carried out using the title "Islamic Finance" and a number of related keywords such as "Fintech," "Financial technology," "Sharia finance," "Islamic banking," "Islamic economics," "Islamic financial institutions," "Islamic capital market," Digital finance," "Islamic financial technology." This search aims to cover all articles relevant to the research topic.

This search will provide a more comprehensive understanding of the research topic and allow researchers to analyze trends and contributions related to equity valuation. By carrying out this literature search, it is hoped that researchers can find relevant and reliable sources to use in bibliometric analysis. Choosing the right keywords and using appropriate software will enable researchers to obtain articles that match the research topic.

Step 2. Initial Search Results

After conducting a literature search using predetermined keywords, the next step is to evaluate the initial search results. In January 2024, this search yielded a number of articles relevant to the topics "Islamic Finance" and "Fintech" or "Financial technology." These search results mainly include scientific journals and articles from related conferences.

This initial process involves selecting the most relevant and high-quality articles from scientific journals and conferences for inclusion in subsequent bibliometric analysis. This research considers factors such as relevance to the research topic, the quality of the journal in which the article is published, and the impact of the article in the scientific literature. By selecting the most appropriate articles, this research can ensure that the bibliometric analysis will be based on strong and representative sources. This step is an important step in ensuring the accuracy and reliability of the results of the bibliometric analysis to be carried out.

In the initial search stage, 529 articles were found published in the last 10 years (2013-2023). In these search results, there are various types of articles such as journal articles, conference articles, book chapters, quotations and reviews found on Google Scholar. After that, a sorting and selection process is carried out to determine the articles that are truly relevant to the topic being discussed. These articles were then collected in the form of a research information system (RIS) format which is based on data from the Google Scholar database. This RIS format includes important information such as quotations, bibliographic information, abstracts, and keywords. By utilizing the information contained in the collected RIS data, researchers can filter articles that meet the specified requirements.

Step 3. Refinement of the search result

After obtaining initial search results involving scientific journals and articles from related conferences, the next step is to refine the search results. This refinement process involved more in-depth research of each selected article to ensure that only the most relevant and high-quality sources were included in the bibliometric analysis with the keyword "Islamic Finance" and a number of related keywords such as "Fintech," " Financial technology," "Sharia finance," "Islamic banking," "Islamic economics," "Islamic financial institutions," "Islamic capital market," "Digital finance," "Islamic financial technology."

In this step, each article will be further analyzed to ensure that the topic fits the scope of the research and that the methodology used in the research meets high academic standards. Articles that do not meet these criteria will be eliminated from the bibliometric analysis. Additionally, articles that are duplicates or have similar content will be identified and removed.

This refinement process aims to ensure that the results of the bibliometric analysis carried out will be based on the most relevant, high quality and unique sources. By conducting rigorous screening of initial search results, this research can ensure that the bibliometric analysis carried out will provide accurate and useful insights into the development of Islamic finance in the fintech era.

This research applies two important criteria. First, the articles you are looking for must be written in English, because this is an international language that is widely understood. Second, the selected articles must be journal or conference articles, because these types of articles often contain relevant empirical studies. Table 1 provides an overview of the screening process for articles that did not meet the inclusion criteria. After this process, 186 articles were found that were suitable for analysis in the initial stage of data collection.

Step 4: Compiling the Initial Data Statistics

PoP software facilitates data collection in RIS format and provides initial statistics including publication year, document type, publisher and publication details. In addition, PoP software also allows descriptive analysis, such as total publications (TP), total citations (TC), number of citations per year, number of citations per publication, number of authors per publication, h-Index, and g-Index (Hudha et al. al., 2020).

Table 2 presents a comparison between the initial search and the refined search. This initial data compilation process provides a more detailed picture of the quality and relevance of the literature sources that have been found. Thus, this research can continue bibliometric analysis with a strong and reliable basis to produce an in-depth understanding of the development of Islamic finance in the fintech era.

Tabel 2: Initial Search

Metrics	Initial search
Title Search	Islamic Finance
Keywords Search	"Fintech", "Financial technology", "Sharia finance", "Islamic banking", "Islamic economics", "Islamic financial institutions", "Islamic capital market", "Digital finance", "Islamic financial technology"
Database	Google Scholar
Languages	All language
Document types	All types
Publication years	10 years: (2013–2023)
Number of articles	529
Citations	5736
Cities per Year	637.33
Cities per Paper	10.84
Authors per Paper	2.21
h-Index	38
g-Index	63
hl, norm	25

hl, annual	2.78
hA index	20

Step 5. Data Analysis

In this research, we use performance analysis and scientific mapping as methods to analyze data. The purpose of performance analysis is to evaluate the contribution of research elements in a particular area, while the purpose of scientific mapping is to explore the relationships between these elements. We utilize PoP software to perform performance analysis, which includes descriptive analysis, publication and citation trend analysis, author analysis, publisher-based analysis, and journal-based analysis. We also perform citation analysis and similarity analysis as part of scientific mapping. To improve understanding through scientific mapping, we use network analysis techniques such as clustering and visualization with support from VOSViewer software.

This research was conducted in January 2024 using the Scopus database as the main literature source. Scopus was chosen because of its trusted reputation for providing quality literature. In the initial stage of bibliometric analysis, we conducted a direct search on the Scopus website by entering keywords relevant to the research focus, such as "Fintech," "Financial technology," "Sharia finance," "Islamic banking," "Islamic economics," " Islamic financial institutions," "Islamic capital market," "Digital finance," "Islamic financial technology."

Initial search results showed that there were 1112 documents covering various types of publications and various time periods. Next, these search results are analyzed further to select the most relevant and high-quality documents so they can be included in a more in-depth bibliometric analysis. This filtering process is important to ensure that the data used in the analysis is the most representative data and can provide an in-depth understanding of developments in this research field.

4. Results and Discussion

4.1. Performance Analysis

In Table 3, analysis is presented by publisher. Springer emerged as the most prolific publisher in terms of the number of publications related to "Islamic finance", with a total of 51 publications. However, in terms of the highest number of citations, publisher taylorfrancis.com stands out with 289 citations. This shows that the publications published on taylorfrancis.com have a strong reputation in Islamic finance literature, so that articles from this publisher are often cited by other researchers.

Additionally, publisher-wise analysis also provides insight into the distribution of citations among different publishers. Springer may have published more articles, but the quality of the articles published by taylorfrancis.com appears to be higher, characterized by a higher number of citations per article. This shows the importance of considering not only the number of publications, but also their quality when evaluating a publisher's contribution to a research field:

Table 3: Top Publisher Based on Citation and Contribution

Row Labels	Count of Publisher	Count of Cites
api.taylorfrancis.com	7	14
dergipark.org.tr	5	33
elgaronline.com	5	2
emerald.com	31	59
oarep.usim.edu.my	7	50
ojs.unito.it	9	99
papers.ssrn.com	22	87
Publisher	8	8

Springer	51	240
taylorfrancis.com	29	289
(blank)		9
Grand Total	**174**	**890**

Cluster	Term
Cluster 1 (Red)	Artificial intelligent
	Bank
	blockchain
	Blockchain technology
	Case
	Company
	effect
	Fintech innovation
	islamic
	Islamic finance education
	Islamic finance principle
	knowledge
Cluster 2 (green)	innovation
	Islamic finance product
	regulation
	shariah
	sustainability
	Sustainable development
Cluster 3 (blue)	Customer
	Challenges
	Business
	Islamic economic
	Islamic economics
	sukuk
	waqf
Cluster 4 (yellow)	sdgs
	Cryptocurrency
	digitalization
	Islamic finance perspective
	Islamic finance sector
	Risk
Cluster 5 (purple)	Implication
	Islamic finance institution

4.2. Science mapping and network analysis

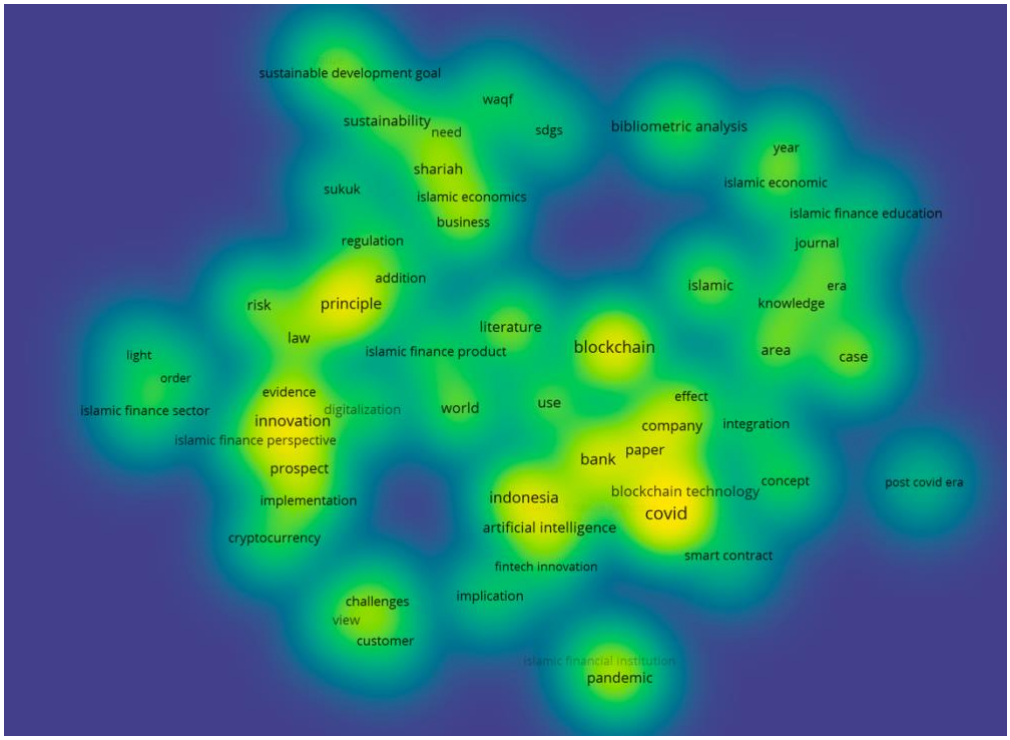

Figure 5: Density Visualization By VOSViewer

Based on the visual representation in Figure 3, the term that appears most frequently is “blockchain”, which is visible with a striking yellow density color. In accordance with visualization principles, the higher the density of an element, the higher the color value used in the visual representation, with a color scale from blue to green to yellow. Therefore, the dominance of yellow in the term "blockchain" shows that this term has the highest number of occurrences and has the strongest relationship among 41 other terms related to the analysis of valuation approaches in the field of Islamic finance in the fintech era. The findings from the Density Visualization are also consistent with the Network Visualization and Clustering Analysis described previously.

Blockchain technology is a mechanism that allows digital transactions to be recorded in a distributed and secure manner. This process involves recording transactions into connected blocks and encrypted with cryptographic methods, creating a network system that cannot be manipulated and is transparent. In the context of Islamic finance in the fintech era, blockchain technology is often the focus of research because of its ability to increase transparency, security and efficiency in financial transactions in accordance with sharia principles.

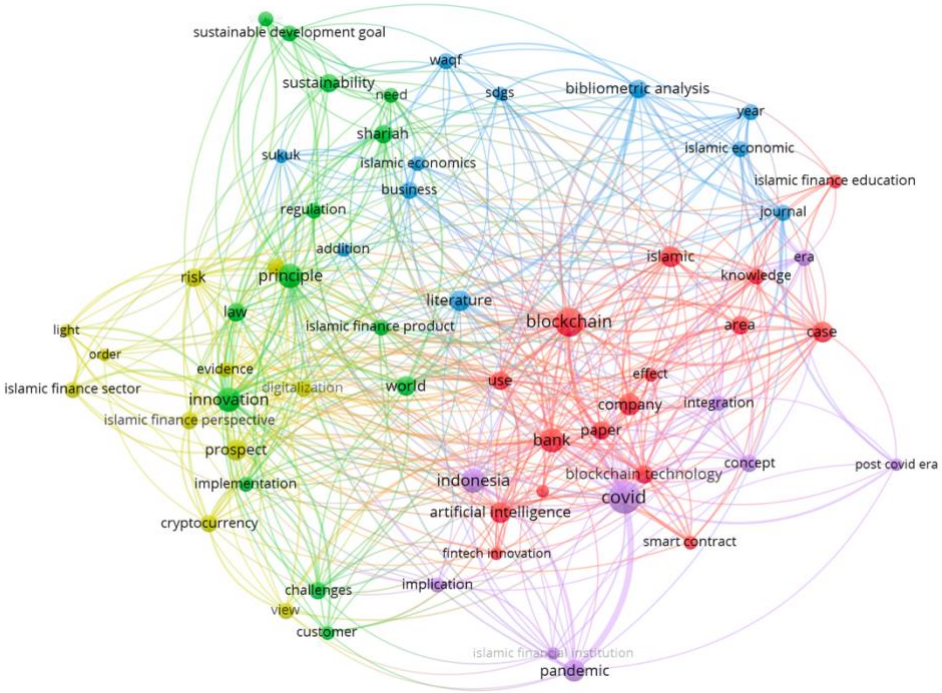

Figure 6: Network Visualization

The relationship between terms can be observed through the network visualization shown in Figure 4. Figure 4 shows the results of the analysis in the form of a network visualization. In this visualization, terms related to Islamic Finance in the Fintech Era are collected based on their clusters, using different colors for each cluster. The largest labels and circles (nodes) indicate that the terms have greater item weight, meaning they have the most occurrences and the strongest strength of association. This finding is in line with the cluster results contained in Table 9. By looking at the size of these nodes, we can use this information as a basis for selecting potential collaborators, determining future research focus, or exploring emerging research trends.

From this node description, we can use it as a basis for conducting research on developing topics. In large nodes there are terms such as Blockchain, Islamic, Innovation, Blockchain Technology, Artificial Intelligence, these are terms that have been widely used in discussions of Islamic Finance in the Fintech Era. So, we can conclude that if the aim of new research is to explore new knowledge or search for novelty, then we can use other terms with smaller node sizes.

In addition, the use of network visualization can also help in understanding the structure of relationships between terms more intuitively. By looking for patterns and connections between terms in a visualization, researchers can identify unexpected relationships or discover dominating themes in the observed literature. This opens up opportunities to explore more deeply interrelated concepts or explore new aspects of the research field.

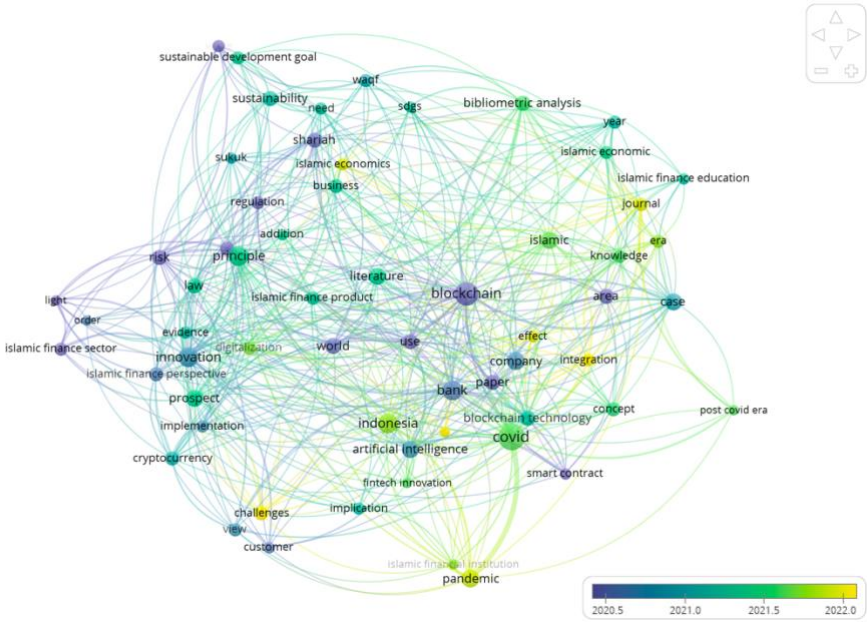

Figure 7: Overlay Visualization

The purpose of overlay visualization on VOSviewer in bibliometric research is to describe and analyze relationship patterns between various bibliometric elements such as authors, journals, keywords, or research subjects in more detail. With overlay visualization, researchers can visually explore the interactions between these elements and how they form relevant clusters or groups in more detail. Through variations in color, size, or symbols, overlay visualization helps identify patterns, trends, or relationships that may not be obvious in conventional bibliometric data analysis. This allows researchers to gain a deeper understanding of the structure, interactions, and developments within a particular research field, as well as gain richer insight into potential collaborations, emerging research themes, or changing trends over time.

The illustration displayed in Figure 5 Overlay Visualization provides a more detailed picture of current research trends related to Islamic Finance. In addition to displaying terms commonly used over the years, the color bar at the bottom right also reflects the scores associated with the colors to indicate the article's impact factor. By using blue for an impact factor below 1, green for close to 2, and yellow for 3 or higher, the overlay visualization enriches the understanding of a term's level of significance. From the results of this Overlay Visualization, it was found that terms such as Islamic finance institutions and sustainable development have become trends in recent years, but discussion about this is still limited. Therefore, it is hoped that further research related to these terms will provide a significant contribution to the existing literature on Islamic Finance in the Fintech Era.

5. Conclusions and Recommendations

5.1. Conclusion

In the study "Future-Proofing Islamic Finance: A Bibliometric Review of the Fintech Era," we use bibliometric analysis to explore information about trends and developments in Islamic finance related to the fintech era. By utilizing bibliometric methods, we can reveal the structure of literature related to this topic in more depth. Our findings indicate a pattern of thematically related research clusters, highlight emerging research trends, and acknowledge the important contributions of several leading journals in this domain.

Through overlay visualization, we found an increasing interest in terms such as "blockchain," "digital finance," and "Islamic fintech" in recent years. However, we found that the number of studies that specifically discuss these aspects in depth is still limited. In this context, further research that explores these terms will make a significant

contribution to the literature on Islamic finance in the fintech era, enriching understanding of the implications of technology for Islamic financial practices.

On the other hand, key terms such as "Islamic banking," "Sharia finance," and "Islamic economics" continue to have great influence in the Islamic finance literature. This shows the continued interest in these concepts in the context of the fintech era. Therefore, further research exploring new dimensions of these terms will help deepen understanding of the evolution of Islamic finance and how it is adapting to changes in the world of technology.

Thus, our conclusion confirms that bibliometric analysis is an effective tool for identifying research trends and provides guidance for future research directions in the field of Islamic finance in the fintech era. Through further research that deepens understanding of trends in key terms and explores new aspects of Islamic finance literature, we can broaden our horizons and knowledge in this domain, as well as respond to the challenges and opportunities faced by Islamic finance in the technological era.

5.2. Suggestion

Based on the results of the bibliometric analysis we conducted in this research, we would like to provide several suggestions for future research in the domain of Islamic finance in the fintech era:

- Delving into Technological Aspects:
  We recommend further research that deepens understanding of the implications of technologies, such as blockchain and digital finance, on Islamic financial practices. This study can dig deeper into the integration of technology in Islamic financial products and its impact on efficiency, transparency and sharia compliance.

- Investigating New Trends:
  It is important to carry out research that focuses on new trends emerging in Islamic finance literature in the fintech era. For example, research on new concepts or innovative business models emerging in the Islamic finance industry related to technology.

- Exploring Traditional Aspects:
  Although new trends are receiving increasing attention, it should not be overlooked that traditional concepts such as Islamic banking and Sharia finance remain at the core of Islamic finance. Research investigating these aspects in the context of technological change can provide valuable insights into the evolution of Islamic finance.

- Collaboration between Disciplines:
  We encourage expanding the scope of research by combining different disciplines, such as economics, law, and information technology. This multidisciplinary collaboration will enable a more holistic understanding of the complexities of Islamic finance in the fintech era.

- Noting Limited Literature:
  We suggest researchers to expand the literature related to Islamic finance in the fintech era, especially in terms of in-depth research on terms that are emerging as new trends. This will help in filling knowledge gaps and stimulate further developments in this field.

By following these suggestions, we believe that future research can make a valuable contribution to the literature on Islamic finance in the fintech era and deepen understanding of the dynamics involved in addressing challenges and opportunities in the context of evolving technologies.

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Research on Countermeasures to Enhance the Innovation Ability of Haining Manufacturing Enterprises in the Digital Era

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Abstract
Haining, as the top ten industrial counties in Zhejiang, a strong manufacturing city, to keep pace with the pace of the digital era, to deepen the digital application of all aspects of the manufacturing production process, to provide a strong momentum for the transformation and upgrading of the manufacturing industry in Haining. Based on the background of digital economy, this paper analyzes the necessity of improving the innovation ability of China's manufacturing enterprises, as well as the problems faced by Haining's manufacturing enterprises in improving their innovation ability, such as the construction of innovation platforms that need to be perfected, the degree of enterprise innovation investment is not high, and the cultivation of digital innovation talents is facing serious challenges, etc., and from the coordination and optimization of the construction of innovation platforms, accelerating the promotion of the construction of digital infrastructure, deepening the reform of the system and mechanism for the development of talents, building The new pattern of digital transformation of higher education and multiple inputs, focusing on stimulating the vitality of innovation and other five aspects of the digital economy era in the context of Haining's manufacturing enterprises to enhance the innovation capacity of countermeasures, aimed at accelerating the creation of Haining City with Haining's recognizable "142" advanced manufacturing clusters, the construction of "manufacturing strong city digital strong city". The purpose is to provide useful reference for Haining City to accelerate the creation of "142" advanced manufacturing clusters with Haining City's recognizability and to build a "strong manufacturing city and digital city."

Keywords: Digital Era, Manufacturing Enterprises, Innovation Capability, Countermeasure Research

1. Introduction

Manufacturing is the foundation of the real economy, and is the lifeblood of the national economy, the implementation of the manufacturing industry digital technology transformation and upgrading project, cultivate and grow advanced manufacturing clusters is to promote the development of regional economic development of the new impetus of the "leading sheep." Under the background of digital economy, manufacturing industry can make full use of cloud computing, Internet of Things, big data and other new generations of information and communication technology, deepen the digital application of key business links of manufacturing enterprises, use digital technology to reshape business models, empowering organizational innovation. Integrating digital

technology with the integration and penetration of manufacturing enterprises to enhance their innovation capability is an important engine to promote the digital transformation and sustainable development of China's manufacturing industry. The current digitalization of the manufacturing industry is constantly deepening, and digital technology is being widely and deeply integrated with the real economy, providing a source of living water for the high-end and intelligent development of manufacturing enterprises.

In order to guide and incentivize the accelerated development of advanced manufacturing clusters around Zhejiang, to guide the comparative advantages of various places to play, Zhejiang to the provincial party committee, the provincial government set up the highest honor in the field of manufacturing industry, "Zhejiang Manufacturing Tiangong Ding," in which the Haining City, Zhejiang Province, captured the first batch of "Tiangong Ding." Haining, as part of the economically developed areas of Zhejiang Province, has always been ranked among the top ten industrial counties in Zhejiang Province, leading the booming development of the manufacturing industry in Zhejiang Province. Due to the significant regional heterogeneity of the impact of the development of digital economy on the innovation enhancement ability of manufacturing enterprises, the digital economy empowers different regions to enhance the innovation ability of enterprises to drive countermeasures and the direction of the role of slightly different, therefore, the article in the existing literature on the basis of research, focusing on Haining City, exploring the digital economy under the environment of Haining's manufacturing enterprises to enhance the innovation ability of the countermeasures, which not only helps to This is not only conducive to enriching the theoretical research results in this field, but also to accelerating the deep integration of digital technology and the real economy, stimulating the enabling effect of the digital economy on the high-quality development of the manufacturing industry, accelerating the creation of the "142" advanced manufacturing clusters with the recognizability of Haining City, and promoting the construction of the "415X" advanced manufacturing clusters at a high level in Zhejiang Province. 415X" advanced manufacturing cluster has important practical value.

2. Literature review

At present, there are fewer studies on the path and countermeasures to enhance the innovation capacity of manufacturing enterprises in the context of the digital economy, and most scholars have unilaterally studied the innovation capacity of enterprises or explored the internal mechanism of digital transformation to empower the high-quality development of enterprises. The representative viewpoints are: innovation capacity is not only a specific organizational resource, it involves a variety of elements (Ke et al., 2023); at the same time, it is a process of dynamic allocation of resources, which will manifest in different forms at different times (Eisenhardt & Martin, 2000), which is the same as Teece's dynamic capacity theory (Teece, 2007). The government should further improve the mechanism and policy system for the improvement of innovation ability, and enterprises themselves should improve their ability to digest and absorb external knowledge (Han & Zhao, 2018); Some scholars have studied the mechanism for the enhancement of independent innovation ability of SMEs based on the perspective of the consortium, combined with multi-case study and rooting theory, and the results show that the internal mechanism, the external mechanism, and the coordinating mechanism are the three main mechanisms for the enhancement of independent innovation ability of China's small and medium-sized enterprises. Mechanism (Ma & Li, 2016), while others believe that the mechanism of enterprise innovation capacity enhancement mainly includes five mechanisms: leadership mechanism, organizational mechanism, learning mechanism, synergy mechanism, and talent cultivation mechanism (Wu et al., 2019;Liu, 2022). This study believes that innovation capability does not only refer to a single technological innovation capability, but it includes a variety of elements, such as organizational factors, market factors, technological factors, managerial factors, institutional factors, and so on. The mechanism of the digital economy to promote manufacturing enterprises to continuously build new competitive advantages is mainly reflected in the innovation behavior from closed to open, and the transformation of the organizational environment from static to dynamic. Digital transformation has become the strategic core of many manufacturing enterprises, Jane Guanqun and Miao Yuxin selected micro-data of Chinese A-share manufacturing enterprises, empirically analyzed the impact of digital economy development on the innovation of manufacturing enterprises and the internal mechanism through the construction of the model, and the study shows that the digital economy can directly and significantly enhance the innovation ability of enterprises on the one hand, and on the other hand, it can also be used to further promote enterprise innovation through the promotion of

digital transformation. Innovation (Jian & Miao, 2024). Under the background of digital economy, the manufacturing industry chain will be deconstructed and reconstructed (Zhang, 2018;Li et al., 2020), and the digital economy will take the digitalized knowledge and information as the key production factors, which will play the role of innovation and empowerment for the high-quality development of manufacturing enterprises (Shen & Huang, 2020). Third, the necessity of improving the digital innovation capability of manufacturing enterprises

General Secretary Xi Jinping pointed out: "the core of manufacturing is innovation, is to master the key core technology, must rely on self-reliance struggle, rely on independent innovation for." Only the key core technology as well as equipment manufacturing industry firmly in their own hands, in order to crack the neck problem. At present, China's manufacturing core technology is still restricted, it is difficult to solve the problem of independent supply of core parts and core technology through original innovation, such as 2023 high-grade CNC systems and components more than 95% from imports, China's chip self-supply rate of about 23.3%, and a number of developed countries are also continuing to upgrade the AI chip export ban, a number of domestic enterprises and R & D institutions are included in the export control List of entities under export control. According to the data released in January 2024 by the McClean Report division of TechInsights, which is responsible for semiconductor market trend research, in the ranking of the Top 25 global semiconductor manufacturers' sales in 2023, there is only one enterprise in mainland China on the list. At the same time, in the international situation and the impact of the epidemic in recent years, the global industrial chain supply chain began to "security and risk prevention" change, the United States and Europe and other developed economies in order to maintain the security of their own industrial chain supply chain, have to promote the return of manufacturing industry, began to establish an independent, autonomous, safe and controllable industrial system, to a large extent, has reduced the availability of imported technology in China. Reducing the availability of imported technology in China, the global industrial chain supply chain has entered a period of reconstruction and change, and is undergoing deep adjustment in the direction of localization, regionalization, diversification and digitalization. At the same time, due to the advanced manufacturing industry is not strong independent and controllable ability, the Internet of Things, cloud computing, industrial big data, artificial intelligence and other applications of the innovation ability are not strong enough, resulting in uneven product quality in China's manufacturing industry, there is a large gap with the developed economies, which directly affects the international competitiveness of China's manufacturing industry. Huawei encountered "extreme pressure" once again proved that only to enhance the original innovation capacity of China's manufacturing industry, with independent intellectual property rights of the core technology in their own hands, focusing on the key core algorithms, core materials, core technologies, core components, core equipment, and so many "! Necked" problem to focus on the attack, in order to truly realize the supply chain independent and controllable, grasp the initiative of competition and development, enhance China's manufacturing industry chain supply chain resilience and security level. Fourth, Haining manufacturing enterprises to enhance the innovation capacity of the problems faced by the

2.1. Innovation platform construction needs to be improved

Haining manufacturing industry innovation public service and financing and other support and service platform construction lagging behind, mainly manifested in the following aspects. First, industrial common technology is the cornerstone of enterprise independent innovation, but the current Haining manufacturing industry technology innovation system there is a major chain link, common technology research and development and service platform is missing, common specialized technology and industrialization platform is limited in the number and level of capacity, it is difficult to break through the "neck" technology constraints. Secondly, the construction of innovation carriers is relatively lagging behind, and the small and medium-sized enterprise science and technology incubators in some districts and counties of Haining City have a low degree of marketization and professional management, with insufficient ability to carry out high-level professional assessment and cultivation of incubated enterprises, and a single mode of operation of the incubators, which is lacking in value-added services such as entrepreneurial counseling, technical support, industrial docking, and so on, and the sustained incubation capacity needs to be improved. Thirdly, the public service platform has a single function, the construction of a comprehensive informatization public service platform is lagging behind, and there is a lack of public service activities such as technical services, intellectual property assessment and consultation, entrepreneurial investment and financing, and transformation of achievements.

2.2. Low investment in innovation by enterprises

The research found that Haining manufacturing industry generally exists in the overall scale is not large, the quality of development is not high, the innovation ability is not strong and other issues, most of the enterprises do not have their own R & D institutions, to build the innovation platform is not enough, the manufacturing industry as a whole independent R & D and innovation ability is not strong, although some enterprises already have their own intellectual property rights, but no matter in the number of patents or the value of the quality of the patent is obviously lacking, involving innovation in the field of patenting is less, lacking in core competitiveness. Although some enterprises already have independent intellectual property rights, but both in terms of quantity and patent quality and value are obviously lacking, involving innovative areas of less patents, lack of core competitiveness. The deeper reasons behind this trend are as follows: Firstly, most small and medium-sized manufacturing enterprises have insufficient awareness of the importance of innovative talents and innovation to enterprise development, lack long-term planning, and are unwilling to invest excessive costs in the introduction of talents and technology R&D, and the enthusiasm for recruiting and attracting talents and innovation needs to be improved; secondly, increasing enterprise R&D investment is a necessary basis for enhancing their original innovation ability and improving the conversion rate of scientific and technological achievements. Secondly, increasing the investment in R&D of enterprises is the necessary foundation for enhancing their original innovation ability and improving the conversion rate of scientific and technological achievements, at present, the insufficient support for digital transformation of small and medium-sized manufacturing enterprises in Haining City and the shortage of funds are the main bottlenecks restricting the enterprises from enhancing innovation and constructing their own core competitiveness, and the docking between the capital market and innovation is not ideal, and it is difficult for the enterprises to raise funds, and the lack of corresponding funds to support the large-scale production of scientific and technological achievements has seriously impeded the demonstration, popularization and application of scientific and technological achievements. The diversified social input system for innovation has not yet been formed, and the diversified input system for innovation by the government, enterprises, finance and private capital has not yet been formed, and the multi-channel input mechanism has yet to be perfected.

2.3. Serious challenges to the training of digital innovation talents

Through research visits to manufacturing enterprises in Haining City, it is found that the key challenges faced by the current digital innovation talent team building mainly include the following aspects. First, the shortage of digital professionals. According to the "Industrial Digital Talent Research and Development Report (2023)", the current total shortage of digital talent in China is about 25 million to 30 million, and the rapid development of the industry in the future will continue to aggravate the shortage of digital talent. Managers of automobile, pharmaceutical and other manufacturing enterprises feedback, the Internet, artificial intelligence and other hot industries with flexible market response ability and first-class innovation ability, the attraction of talent far more than the manufacturing industry. By visiting Haining City, new materials, pan-semiconductor, intelligent high-end equipment manufacturing enterprises, managers reflect the digital innovation talent in recent years in short supply, enterprises have to establish a market-competitive salary system to attract and retain employees, greatly increasing the cost of manufacturing enterprises to introduce innovative talent. Secondly, the supply of digital innovation talents in universities is out of line with the actual demand of manufacturing enterprises. With the rapid development of digital technology and the increasing integration of the manufacturing industry, the intelligent manufacturing industry has put forward new requirements for the digital literacy ability and innovation ability of laborers. After the Haining City manufacturing industry enterprise managers interviews show that Haining "digital craftsmen" school and enterprise incubation environment there are short boards, did not form the linkage of industry, academia and research digital innovation talent training mechanism, there is a general lack of depth of university-industry-academia-research cooperation, lack of supply of higher education digital skills composite talents and other issues, the contradiction between the supply and demand of skills is mainly reflected in the university graduates in the intelligent manufacturing industry, the supply of digital innovation talent and the actual needs of the manufacturing industry. The contradiction between supply and demand of skills is mainly reflected in the lower ability of college graduates to apply digital technology in the intelligent manufacturing industry, and their ability to innovate and innovate is not strong. Thirdly, the enthusiasm for digital innovation of employees in

manufacturing enterprises is not high. Most of the manufacturing enterprises in Haining City do not have a strong innovation atmosphere, the enthusiasm of employees for digital innovation is not high, and there is a lack of institutional mechanisms within the enterprise to promote the transformation of employees' digital thinking and activate employees' vitality for digital innovation.

3. Digital economy empowers Haining's manufacturing enterprises to enhance the innovation ability of countermeasures

3.1. Coordinate and optimize the construction of innovation platforms

First, Plan and layout the construction of high-skill innovation platforms. Focusing on the national strategic objectives, the major needs of Zhejiang Province and the development needs of Haining City's innovative industries, we actively declare the construction of various types of innovation platforms at the national and provincial levels, integrate into the national and provincial strategic scientific and technological forces, improve the system of Haining's innovation platform bases, and accelerate the construction of provincial key laboratories, industrial research institutes, and enterprise research and development centers in the fields of new materials, pan-semiconductors, energy storage, and intelligent and high-end equipment manufacturing to create a High-level innovation platform. Second, build new R&D organizations. Docking the introduction of the world's top 500 enterprises, Zhejiang Province and other outstanding universities, high-end scientific research institutions, provincial local state-owned enterprises to Haining City alone to set up new R & D institutions, or joint Haining enterprises, research institutes, colleges and universities and other high-level new R & D institutions, to promote the industrial chain, the chain of talent, the depth of the integration of the innovation chain. Efforts to build enterprise-led industry-university-research-use deep integration of innovation consortium, the establishment of applied basic research, key core technology research, industrial common technology R & D and services as the core business, set the scientific and technological achievements of R & D, results of the pilot maturation, transformation of innovative achievements and small and medium-sized enterprise incubation as a whole of the independent legal person of the new innovation body to accelerate the innovation of high-quality development of the manufacturing industry. Third, build a ladder cultivation mechanism to systematically promote the construction of high-level innovation platforms. On the one hand, for manufacturing enterprises that have not constructed innovation platforms, we encourage them to organize a wide range of industry-university-research docking and exchange activities to improve their innovation capabilities, and in cooperation with the government, enterprises, scientific research institutes, etc., we will guide them to establish innovation platforms in accordance with the four criteria of "R&D sites, R&D investment, R&D teams and R&D projects." According to the standard of "four", enterprises above the scale with R&D activities will be guided to set up various forms of R&D institutions within their units in accordance with their own development needs, so as to improve the coverage rate of R&D institutions above the scale of industrial enterprises and organize and guide them to upgrade their R&D institutions gradually in accordance with the standard of municipal-level innovation platforms. On the other hand, for manufacturing enterprises that already have municipal-level innovation platforms, the government should also strengthen support and guidance, implement innovation platforms to cultivate action, and promote their upward benchmarking of provincial and national-level innovation platforms and gradual upgrading.

3.2. Accelerating the development of digital infrastructure

First, the deployment of digital infrastructure construction should be moderately ahead of schedule. Haining Municipal Government should base on Haining's local industrial demand and actual development situation, uphold the principle of "moderately ahead of schedule", and comprehensively promote the construction of new infrastructure such as 5G base stations, integrated data centers, cloud computing centers, industrial Internet, etc., so as to improve the ability of supplying services for digital transformation, and provide the underlying support for building the digital future. At the same time, in order to maximize the benefits of the new infrastructure in the whole life cycle, it should focus on the optimization of its location and layout, adhere to the system concept, coordination, and strengthen the technological convergence, network synergy, and intelligent interaction between different regions of Haining City, so as to promote the overall effectiveness of the new infrastructure to play a sustained role. Second, synergize the deployment of data and arithmetic infrastructure. Construct a diversified

arithmetic supply system with the collaborative development of cloud computing, edge computing, intelligent computing and supercomputing, build a factor system with "arithmetic+algorithm+data" as the core to enhance the degree of integration, guide Haining City to form a new type of data center development pattern with a reasonable layout, advanced technology, green and low-carbon, and interconnection, and push forward the digitization of business and process flow, and fully build a centralized and integrated data center. process digitization, and comprehensively build an intensive, green, intelligent, ubiquitous and resilient Haining City integrated arithmetic infrastructure. Third, strengthen the support guarantee. Strengthen local and departmental coordination, make good use of the task force mechanism, build a "government, industry, academia, research and gold taking" school-enterprise collaborative education community, focus on strengthening the policy support and financial guarantee for Haining City's manufacturing industry transformation and upgrading to speed up again, build a safe, compliant and trustworthy data circulation and application system, and provide support for the promotion of cross-industry and cross-region data elements circulation, creating a good environment for the development of the digital economy. Support for the development of digital economy to create a good ecology.

3.3. Deepening the reform of institutional mechanisms for talent development

Constructing a self-reliant and self-reliant digital technology innovation system depends on high-level digital innovation talents in the final analysis, and the key to fully releasing the innovation vitality of digital innovation talents lies in the institutional mechanism. First, build a scientific talent evaluation system to stimulate the innovation vitality of digital talents. Encourage Haining universities, scientific research institutions and local manufacturing enterprises to actively promote the reform of the evaluation mechanism of digital innovation talents, enrich the form of contribution recognition in the innovation contribution incentive system, such as strengthening the incentives for personnel and teams who have won important scientific and technological awards, high-value patents, undertake national innovation projects, etc., and improve the assessment mechanism of the innovation team, highlighting the distinctive orientation of quality and contribution, which is of great significance for mobilizing digital talents. It is of great significance to mobilize digital talents' enthusiasm for innovation and entrepreneurship. Secondly, explore and carry out joint innovation system and mechanism, and build and cultivate innovation consortium. Support cross-industry and cross-field talents to collaborate and fight as a team, work together to overcome problems in the same direction and goal, guide talents to form innovation synergy, build an innovation consortium led by leading enterprises, supported by colleges and universities, and synergized by various innovation subjects, and jointly build an innovation ecosystem covering talents, funds, projects, and application scenarios, so as to build a modern manufacturing industry system with the characteristics of Haining to provide strong Talent support.

3.4. Building a new landscape for digital transformation in higher education

The digital transformation of higher education is not only an upgrade at the technical level, but also a profound change, which is mainly reflected in the following aspects. First, accelerate the digital transformation of colleges and universities, and carry out the cultivation of disciplinary composite. Colleges and universities need to be guided by the needs of the manufacturing industry, integrate the cutting-edge technologies of the digital economy, promote the cross-fertilization of higher education disciplines, strengthen interdisciplinary and cross-field cooperation and communication, integrate digital literacy into the curriculum, form a digital curriculum system with the characteristics of the times, update and improve the relevant teaching materials, teaching cases and other teaching resources, explore and practice new teaching modes, and focus on strengthening the cultivation of cross-border integration of the thinking ability, digital literacy ability and innovation ability, and broaden the students' ability to develop and develop the digital literacy skills. The first step is to promote the development of digital literacy, digital literacy ability and innovation ability, broaden students' knowledge horizons and breadth of thinking, and promote the cultivation of digital talents with a digital literacy framework to promote the digital transformation of education. Second, continue to promote the digital transformation of teacher team building. Teachers as the practice of digital education development of the main body and supportive force, is a profound change in the education model and the key to the innovation of education concepts, teachers can take the lead in the realization of the digital transformation, a direct impact on the results of the education digital strategy action. In order to promote the digital transformation of Haining's teaching force, the top-level design and grassroots

exploration can be used to systematically promote the digital transformation of the teaching force, such as the timely introduction of the guide to the digital development of teachers and other guiding documents to clarify the course of action and key tasks, and to promote the standardization of teachers to carry out various digital education and teaching practices; focus on the actual needs of teachers to carry out digital training, and continue to enhance the ability of college teachers to carry out digital teaching; build the capacity of teachers to carry out digital teaching; and build the capacity to carry out digital teaching. Focus on the actual needs of teachers, carry out digital training, and continuously improve the ability of college teachers to carry out digital teaching on a regular basis; build a regional digital teacher training platform in Haining City, set up an integrated and intelligent digital teaching and research space, and create a collaborative teaching and research network linking schools and districts. Third, deepen the integration of government, school, enterprise, industry, academia and research to create a digital economy talent highland. To give full play to the advantages of Haining City, rich in university resources, strong scientific research institutes, and bursting with enterprise innovation and vitality, we should explore the talent training mechanism of industry-university-research linkage, jointly carry out the key core technology research, promote the integration of innovation and industrial innovation, actively serve the upgrading of the national manufacturing industry as well as the development of Haining's regional economy, and revise the digital talent training program based on the vocational needs of digital talents in the manufacturing industry. We will revise the digital talent training program based on the vocational needs of digital talents in manufacturing industry, set up a "transformation bridge" between scientific research results and industrialization, promote the organic convergence of digital innovation talent training and the needs of manufacturing industry, deepen the cooperation between schools and enterprises, schools and localities, strengthen the synergistic innovation, and build a "talent development community" with win-win cooperation, complementary advantages and resource sharing. "for the high-quality development of manufacturing industry in Haining to inject new momentum.

3.5. Multiple inputs to stimulate the vitality of innovation

First, increase the financial investment in science and technology. Haining City, the relevant financial departments should conscientiously implement the Party Central Committee, Zhejiang Province, Haining City, on the deployment of support for innovation, play the role of government traction, advanced manufacturing investment "lead" program, the establishment of special funds for innovation, increase the expenditure of science and technology special funds for the manufacturing industry to carry out original leading scientific and technological research, recruitment It will also increase the expenditure of special funds for science and technology to provide solid financial support for the manufacturing industry to carry out original and leading scientific and technological research, attract talents and venture capital. Secondly, build a diversified investment and financing system for innovation. Haining City, the financial sector should strengthen the synergy of financial and fiscal policies, the implementation of the new mechanism of cooperation between the government and banking and financial institutions, social capital, give full play to the role of financial funds "four or two pounds" prying role, the normalization of the promotion of major projects to financial institutions and private capital, with the help of funds, financing, and other financial tools, effectively guide its Increase support for innovation, tilt more financial resources and private investment flows to innovation, advanced manufacturing and other key areas, and effectively enhance the efficiency of resource allocation. Thirdly, enhance the enthusiasm of enterprises' own funds for R&D investment. The report of the 20th CPC National Congress emphasized that it is necessary to "strengthen the status of the main body of enterprise innovation," and innovation is the inevitable choice and top priority for the company's high-quality development, which also means that the enterprise has an important social responsibility and historical mission to promote the autonomy of the key core technologies, build a modernized industrial system, and realize the scientific and technological self-reliance and self-improvement. Enterprises should proactively adapt to and lead the new round of scientific and technological revolution and industrial change, strengthen the awareness of innovation, enhance the enthusiasm of R&D investment, optimize the innovation ecosystem, establish an enterprise-led technological innovation system for the in-depth integration of industry, academia and research, and strive to play a dominant role in the enterprise in the areas of innovation decision-making, R&D investment, scientific research organization and scientific and technological transformation, and make more efforts to enhance the effectiveness of innovation in the manufacturing industry.

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Talent Management, Leadership, and Organizational Culture: How Quality of Service Influences Excellent Service at Indonesia's Bhayangkara Hospital

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Abstract
The purpose of this research is to examine and develop excellent service at Bhayangkara Hospital by improving talent management, leadership, and organizational culture through service quality. This study employed an associative quantitative approach using a sample of 358 employees from 11 Bhayangkara Type B hospitals drawn from a population of 3452 using the Slovin formula. The data was analyzed using structural equation modeling (SEM) with the LISREL Version 10.20 application. The findings of this study reveal that key factors such as talent management, leadership, and organizational culture have a positive and significant effect on excellent service through partial quality of service. Based on this, we conclude that talent management, leadership, organizational culture, and service quality all have a positive effect on providing excellent medical services at Bhayangkara Hospital. Thus, we suggest practical implications such as investment in talent management, effective leadership, and positive organizational culture to improve the quality of service in hospitals.

Keywords: Talent Management, Leadership, Organizational Culture, Excellent Service, Quality of Service

1. Introduction

The goal of health sector development is to increase the community's access, quality, and equity of health services (Oliver, & Mossialos, 2004). The primary goal of health sector development is to promote public health by making health services more accessible, egalitarian, and inexpensive to both urban and rural communities. In this framework, hospitals play an important role as institutions that provide comprehensive individual health care through inpatient, outpatient, and emergency services. Health development in hospitals strives to establish a society that values healthy behavior, which includes awareness, desire, and the ability to live a healthy life and have access to quality health services in order to live in a healthier environment.

Regulations in Indonesia categorize hospitals based on their service capabilities, health facilities, supporting facilities, and human resources. Hospital rankings are divided into Class A, Class B, Class C, and Class D. The

largest number of hospitals (RS) in Indonesia according to class is type C at 1,593 (52.4%), then class D and D Pratama at 905 (29.8%), class B at 437 hospitals (14.4%), and class A at 60 (2.0%), while the remaining 47 (1.5%) were hospitals in categories whose class had not been determined (47 RS). Hospitals registered with the Ministry of Health are operated by various agencies or institutions, including the central government, regional government, police, and national army, as well as state-owned and private enterprises. In 2021, 36 hospitals will be organized by the Ministry of Health (1.2%), 63 hospitals from other ministries and state-owned enterprises (2.1%), 168 hospitals (5.5%) organized by the National Army/Police, and 847 hospitals (27.8%), by Regional Government, while the private sector operates the largest number of hospitals with 1,928 hospitals (63.4%).

As a health service institution, hospitals must pay attention to quality and patient safety (Graban, 2018). Fulfilling the quality of service in hospitals is carried out in two ways: by improving quality internally and externally. Internal quality is carried out periodically every month through the establishment, assessment, and reporting of national and external quality standards, namely through hospital accreditation surveys by the Independent Accreditation Organizing Institution. According to Law No. 44 of 2009 concerning Hospitals, "hospitals are obliged to improve the quality of service, which is evaluated periodically, at least once every 3 years, and is guided by applicable standards.

Quality of service involves meeting patient needs holistically, including physical, emotional, and psychological aspects. Besides Quality of Service, there is the Excellent Service concept which emphasizes the importance of understanding and responding to patient needs as a whole to provide the most positive experience (Sari, Kartikasari & Ulfah, 2021). Quality of service and excellent service are closely related because excellent service is the result of efforts to achieve optimal quality of service. In the context of health services, excellent service refers to the highest standards in providing services to patients or customers (Sumarni & Gunawan, 2022). In contrast, quality of service involves all aspects of the delivery of care or services that meet patient expectations and needs.

Bhayangkara Hospital is one of the hospitals that provide services in the form of inpatient health services, 24-hour emergency room, laboratory, radiology, outpatient health services, medical supporting health services, medical check-up, integrated service center, prisoner health services, *visum et repertum* and autopsy, and drug services. The number of Bhayangkara Hospitals based on type throughout Indonesia is 58 hospitals, 1 Bhayangkara Hospital with type A, 11 Bhayangkara Hospitals with type B, 27 Bhayangkara Hospitals with type C, and 18 Bhayangkara Hospitals with type D. Bhayangkara Hospital tasked with carrying out Police Medical service activities to support the operational duties of the National Police and Police Health Services for Civil Servants at the National Police and their families as well as the general public in an excellent manner.

Based on the recap of the 2022 National Bhayangkara Type B Hospital Quality Indicator data collection, almost all Bhayangkara Type B Hospitals have met national standards. However, there are still four Bhayangkara Type B Hospitals (Bhayangkara Hospital Jambi, Bhayangkara Hospital Jayapura, Bhayangkara Hospital Setukpa Polri and Bhayangkara Balikpapan Hospital) which do not comply with national standards. This is because the systems and processes in the hospital are less than optimal to achieve the expected level of compliance. This can also be caused by problems in time management, coordination, and communication, and a lack of awareness or commitment to the importance of complying with quality standards can result in low levels of compliance. This can be seen in the results of observations regarding several problems faced by the four Bhayangkara hospitals which do not meet national standards, such as complaints regarding the lack of communication skills of health workers, poor service to patients, poor sanitation and hygiene aspects, delays in treatment and drug services, and so on. which shows that several Bhayangkara Type B Hospitals have not yet complied with quality standards.

Referring to the aforementioned phenomenon, this study was carried out in response to the 2022 Bhayangkara Type B Hospital National Quality Indicator data, which shows that numerous hospitals still fail to fulfill national criteria. The goal of this research is to identify the reasons that may be causing such disparities. Talent management, leadership, and organizational culture are some of the elements that might have an impact on providing outstanding service in hospitals. By understanding these factors, it is hoped that researchers can provide insight into improving systems and practices at Bhayangkara Hospital so that they can increase the level of compliance with national quality standards.

It is hoped that the results of this research will be useful for developing theories regarding talent management, leadership, organizational culture, and excellent service through quality of service. Apart from that, it can be used as input or reference material and studied for the development of theory and knowledge in the field of human resource management, especially regarding talent management, leadership, organizational culture, and excellent service through quality of service. Practically, this research is expected to be used as input or benchmark as well as consideration for company leaders to adopt policies related to talent management, leadership, organizational culture, and excellent service through quality of service.

To show that there is novelty between this research and research that has been carried out previously, the researchers attempted to compare the various variables, research methods, and results of research that has been carried out regarding the excellent service of Bhayangkara Polri Hospital by strengthening talent management, leadership, and organizational culture through hospital quality of service. The novelty of this research is that it combines key factors, namely talent management, leadership, and organizational culture, as elements that are considered to influence the quality of service in hospitals. This approach has never been used before in the context of the Bhayangkara Polri Hospital or perhaps has never been used holistically in similar research at other hospitals. This research is novel in its specific context, namely, excellent service at Bhayangkara Hospital.

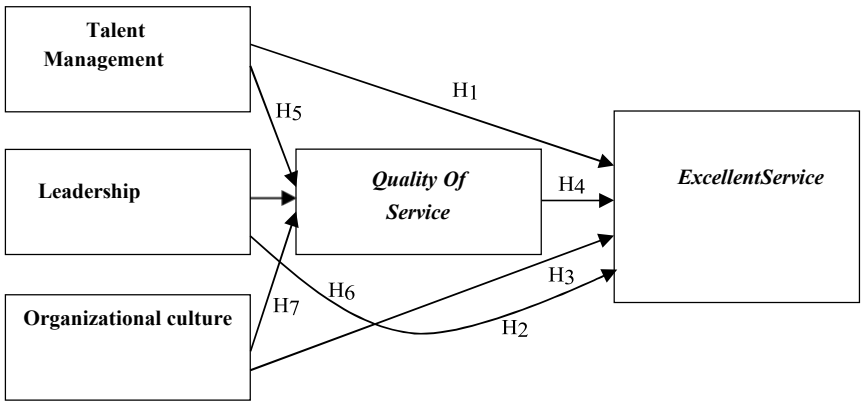

Figure 1: Conceptual Framework
Source: Author (2023)

The variables are divided into two, namely dependent variables and independent variables. According to De Nisi (2000), to achieve excellent service, organizations need to ensure that they have high-quality individuals in important positions. Talent management plays a role in ensuring that organizations can recruit, develop, and retain individuals with high ability and potential to provide excellent service. Regarding leadership variables, the results of research conducted by Faidi et al. (2020) show that good visionary leadership has an impact on excellent service, in line with the hypothesis of this research. Likewise, the research results of Dwi and Joko (2017), that there is a positive and significant influence of organizational culture on excellent service quality. Dewiana's findings also concluded that in 2022, excellent service will have a positive and significant effect on quality service. These three independent variables (talent management, leadership, and organizational culture) also influence service quality (Khalood, and Nor, 2023). This is what underlies the researcher's hypothesis, as follows:

H1: It is suspected that Talent Management influences excellent service
H2: It is suspected that leadership influences excellent service
H3: It is suspected that organizational culture influences excellent service
H4: It is suspected that quality of service influences excellent service
H5: It is suspected that Talent Management influences quality of service
H6: It is suspected that leadership influences the quality of service
H7: It is suspected that organizational culture influences the quality of service

2. Method

2.1. Data Collection

Based on the problem and objectives, this research uses a type of quantitative research that attempts to explain the causal relationship between variables through hypothesis testing. In this case, it explains whether there is an influence from the excellent service of the Bhayangkara Polri Hospital by strengthening talent management, leadership, and organizational culture through the hospital's quality of service. This research applies associative research methods, which aim to determine the relationship between two or more variables. The population used in this study was 3,452 employees from 11 Bhayangkara Type B hospitals. The reason for choosing Bhayangkara Type B Hospital was based on its potential to make a significant contribution to the development of science and the improvement of health services. To calculate the determination of sample size, the Slovin formula is used.

$$n = \frac{N}{N.(d^2) + 1}$$

With this technique, a sample of 358 respondents was taken. The process of selecting and collecting samples was carried out using the proportional stratified random sampling method. Following the approach and research methods used, this research has two types of data, consisting of primary data and secondary data. There are several methods used, namely observation, document study, and questionnaires. The type of questionnaire used in this research is a closed questionnaire. This research also uses a questionnaire with a Likert scale to measure the respondent's level of agreement with the statements stated in the questionnaire. The research instrument provides alternative answers to each question, and respondents can choose 1 to 5, which are provided with alternative answers chosen for each statement. The Likert scale consists of five scales: strongly agree (SA), agree (A), somewhat agree (SMA), disagree (D), and strongly disagree (SD).

Table 2: Variable Operation

Variable	Dimension	Indicators	Question Items
Talent Management **(X1)**	1. Talent Attraction	• Social Domain	1
		• Organizational Excellence	2
	2. Talent Development	• Performance Management	3
		• Talent Training	4
		• Leadership Development	5
	3. Talent Retention	• comparison	6
		• Job Satisfaction	7
		• Non-financial Reward	8
		• Employee empowerment	9
		• employee motivation	10
Leadership (X2)	1. briefing/instruction	• Giving a clear instruction	1
		• encourage initiatives	2
		• Communicate the Vision	3
	2. Communication	• openness	4
		• Empathy	5
	3. Decision Making	• Information Analysis	6
		• Courage to Take Risk	7
	4. Motivating	• Giving Appreciation	8
		Positive encouragement	9
		Creating positive environment	10
Organizational	1. Innovative in	• creating new ideas	1

Culture (X3)	calculating risk	• courage to take risks in developing new ideas	2
	2. result oriented	• target setting	3
		• Evaluation of the results of the work done	4
	3. Oriented to all employee interests	• Met the need to finish the task	5
		• Supporting the achievement of the employee	6
Variable	**Dimension**	**Indicator**	Question items
	4. Detail oriented on tasks	• **careful**	7
		• **Accuracy of work**	8
***Excellent service* (Y)**	1. Efficient	• **Resource utilization**	1
		• **Structured work processes**	2
	2. Effective	• **Result achievement**	3
		• **Service Quality**	4
	3. Clear	• **Communication**	5
		• **Presentation of information**	6
	4. Economic	• **Resource utilization**	7
		• **Budget management and expenditure**	8
	5. Certainty of time	• **Fulfillment of schedules**	9
		• **Completion of tasks on time**	10
	6. Accuracy	• **Accurate and precise data or information**	11
		• **Appropriate action according to protocol or applicable procedures**	12
	7. Safety	• **Risk prevention**	13
		• **Implementation of security standards**	14
	8. Fair	• **Equal treatment**	15
	9. Responsibility	• **Perform duty**	16
	10. Comprehensive	• **Comprehensive and detailed information, documentation or actions**	17
	11. Professional	• **Ethical attitude and respect for professional ethics**	18
***Quality of service* (Z)**	1. National Hospital Quality Indicators (INM-RS)	• **Hand Hygiene Compliance**	1
		• **Compliance with the Use of Personal Protective Equipment (PPE)**	2

		• **Compliance Patient identification**	3
Variable	**Dimension**	**Indicator**	Question items
		• **Emergency Cesarean Section Response Time**	4
		• **Outpatient Waiting Times**	5
		• **Postponement of Elective Surgery**	6
		• **Adherence to doctor visit times**	7
		• **Reporting Critical Laboratory Results**	8
		• **Compliance with the use of the National Formulary**	9
		• **Adherence to the Clinical Pathway Flow**	10
		• **Compliance with efforts to prevent the risk of patient falls**	11
		• **Complaint Time Response Speed**	12
		• **Patient Satisfaction**	13
	2. Hospital Priority Quality Indicators	• **Patient Identification Compliance**	14
		• **Hand Hygiene Compliance**	15
		• **Compliance with efforts to prevent the risk of patient falls**	16
		• **Availability of running water 24 hours**	17
	3. Unit Priority Quality Indicators	• **Patient Satisfaction Survey**	18
		• **Reporting of Critical Laboratory results**	19

2.2 Data Analysis

The data analysis technique in this research uses the structural equation model (SEM) with the LISREL 10.20 program. Data analysis using a confirmatory strategy with a two-step approach, namely the measurement model-2nd CFA test and the hybrid structural model test. This path analysis model uses the following model and structural equations:

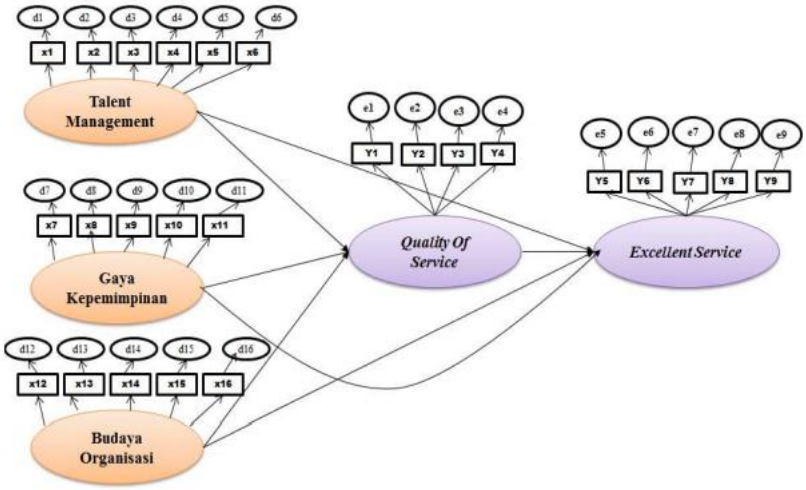

Figure 2: Schematic Model of Relationships Between Variables
Source: Author (2023)

3. Results

3.1. Descriptive Variable Analysis

The data obtained in this research was in the form of distributing questionnaires to employees of Bhayangkara Type B Hospital, with a total sample of 358 respondents. In total, the three indicators used to measure the talent management variable produced a respondent answer of 4.06; this value, when referring to the interval scale, falls into the 3.40–4.19 category, meaning that overall talent management (X1) at 11 Bhayangkara Type B hospitals falls into the good category.

In total, the four indicators used to measure the leadership variable (X2) produced a respondent answer of 4.08; this value, when referring to the interval scale, falls into the category 3.40–110.19, meaning that overall leadership at 11 Bhayangkara Type B hospitals is in the category Good.

In total, eight indicators used to measure the organizational culture variable (X3) produced a respondent answer of 4.07; this value, when referring to the interval scale, falls into the category 3.40–4.19, meaning that overall organizational culture at 11 Bhayangkara Type B hospitals falls into the good category.

.In total, eleven indicators used to measure the excellent service (Y) variable produced a respondent answer of 4.07; this value, when referring to the interval scale, falls into the 3.40–4.19 category, meaning overall excellent service at 11 Bhayangkara Type B hospitals falls into the good category.

In total, the four indicators used to measure the Quality of Service (Z) variable produced a respondent answer of 3.91. This value, when referring to the interval scale, is in the 122 categories, 2.50–3.24, meaning that the overall quality of service at 11 Bhayangkara hospitals, Type B, is in a good category.

3.2 Validity and Reliability Test

The validity and reliability results in the SEM model in the Lisrel program version 10.20 were obtained from the first stage, namely confirmatory factor analysis (CFA). In this first stage, the observed variables or indicators for each latent variable must first meet the validity and reliability requirements. After all the tests meet the requirements, the second stage is carried out, namely the second-order CFA (2ndCFA) from Lisrel 10.20 processing. The results obtained are in the form of a path diagram and printed output. The variables talent management, leadership, and organizational culture were then tested on the instrument with a significance level of 0.05 using Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO-MSA) factor analysis and obtained a KMO value of 0.947 ≥ 0.05 and a loading factor value for each statement greater than 0.4. So it can be said that

all leadership statements can be continued for further analysis. Based on the results of standardized estimates of the variables talent management, leadership, and organizational culture, all indicators have loading factors above 0.60, which shows that these indicators are valid for measuring the construct.

3.3 Structural Model Result (T-value)

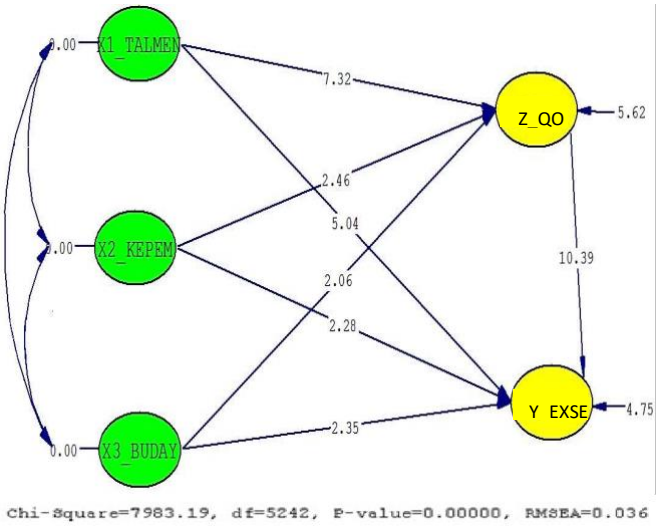

Figure 3: Structural Model Result T-value

Source: Author, (2023)

3.4 Hypothesis testing

After the goodness of fit criteria are met for the estimated structural model, then analysis of the model's structural relationships (hypothesis testing) can be carried out.

Table 3.1: Structural Equation

Path	*Standardized path estimate*	*t-value*	t-table
TALMEN → *EXSER*	0.15	5.04	> 1.96
LEADER → *EXSER*	0.23	2.28	> 1.96
CULTUR → *EXSER*	0.24	2.35	> 1.96
TALMEN → *QOS*	0.10	7.32	> 1.96
LEADER → *QOS*	0.15	2.46	> 1.96
CULTUR → *QOS*	0.16	2.06	> 1.96
EXSER → *QOS*	0.65	10.39	> 1.96

Source: Processed Data, 2023

Table 3.2: Variance explained

Variance explained for endogenous variable	**R^2**
EXSER	0.394
QOS	0.483

Source: Processed Data, 2023

After assessing the model as a whole and testing the construct relationships as hypothesized, the next step is to discuss the research results as follows:

1) The influence of talent management on excellent service obtained a t-value of 5.04 > 1.96. The anticipated positive Talent Management to Excellent Service coefficient value shows 0.15. This condition can be interpreted as meaning that a positive coefficient value encourages a significant and strong influence between the two variables above. Based on these results, it shows that H1 is accepted and H0 is rejected, which means that the talent management variable has a positive and significant effect on the excellent service variable.
2) The influence of leadership on excellent service obtained a t-value of 2.28 > 1.96. The anticipated positive Leadership to Excellent Service coefficient value shows 0.23. This condition can be interpreted as meaning that a positive coefficient value encourages a significant and strong influence between the two variables above. Based on these results, it shows that H2 is accepted and H0 is rejected, which means that the Leadership variable has a positive and significant effect on the Excellent Service variable.
3) The influence of organizational culture on excellent service obtained a t-value of 2.35 > 1.96. The positive anticipated Organizational Culture to Excellent Service coefficient value shows 0.24. This condition can be interpreted as meaning that a positive coefficient value encourages a significant and strong influence between the two variables above. Based on these results, it shows that H3 is accepted and H0 is rejected, which means that the Organizational Culture variable has a positive and significant effect on the Excellent Service variable.
4) The influence of quality of service on excellent service. The anticipated positive Quality of Service to Excellent Service coefficient value shows 0.65. This condition can be interpreted as meaning that a positive coefficient value encourages a significant and strong influence between the two variables above. Based on these results, it shows that H4 is accepted and H0 is rejected, which means that the Quality of Service variable has a positive and significant effect on the Excellent Service variable.
5) The influence of talent management on quality of service. Based on Table 3.1, the t-value is 7.32 > 1.96. The anticipated positive Talent Management to Quality of Service coefficient value shows 0.10. This condition can be interpreted as meaning that a positive coefficient value encourages a significant and strong influence between the two variables above. Based on these results, it shows that H5 is accepted and H0 is rejected, which means that the Talent Management variable has a positive and significant effect on the Quality of Service variable.
6) The influence of leadership on quality of service. Based on Table 3.1, the t-value is 2.46 > 1.96. The anticipated positive Leadership to Quality of Service coefficient value shows 0.15. This condition can be interpreted as meaning that a positive coefficient value encourages a significant and strong influence between the two variables above. Based on these results, it shows that H6 is accepted and H0 is rejected, which means that the Leadership variable has a positive and significant effect on the Quality of Service variable.
7) The influence of organizational culture on quality of service. Based on Table 3.1, the t-value is 2.35 > 1.96. The positive anticipated Organizational Culture to Quality of Service coefficient value shows 0.16. This condition can be interpreted as meaning that a positive coefficient value encourages a significant and strong influence between the two variables above. Based on these results, it shows that H7 is accepted and H0 is rejected, which means that the Organizational Culture variable has a positive and significant effect on the Quality of Service variable.

4. Discussion

4.1 The Influence of Talent Management, Leadership, and Organizational Culture on Excellent Service

The Talent Management variable has a positive and significant effect on the Excellent Service variable. This condition can be interpreted as meaning that a positive coefficient value encourages a significant and strong influence between the two variables above. This research is in accordance with the theory that Talent Management is a concept related to human resource management that aims to develop employees and retain them in the long term (Donald, 2014).

The Leadership variable has a positive and significant effect on the Excellent service variable. This condition can be interpreted as meaning that a positive coefficient value encourages a significant and strong influence between the two variables above. This research is in accordance with previous research by Faidi., et, al, (2020) that the influence of good visionary leadership has an impact on excellent service. This research is in accordance with the theory that the leadership philosophy of the past has the potential to be developed professionally in the present (Priest & Seemiller, 2018).

The Organizational Culture variable has a positive and significant effect on the Excellent Service variable. This condition can be interpreted as meaning that a positive coefficient value encourages a significant and strong influence between the two variables above. This research is in accordance with the theory put forward by Robbins that the function of the existence of an organization is to increase mutual commitment (Wardiah, 2016). This is also in accordance with Rahmayanty's statement that in providing excellent service it is necessary to pay attention to providing motivation and encouragement as well as providing education and training to improve employee quality, paying attention to employee welfare as well as monitoring and controlling the system (Dewi & Hariyati, 2017).

The Quality of Service variable has a positive and significant effect on the Excellent Service variable. This condition can be interpreted as meaning that a positive coefficient value encourages a significant and strong influence between the two variables above. This research is in accordance with previous research by Novitasari (2022) which concluded that Excellent Service has a positive and significant effect on Quality Service.

The novelty of this research provides a new contribution to the field of health services, especially at the Bhayangkara Polri Hospital. This research shows that quality of service has a positive and significant influence on excellent service, which is an indicator of a hospital's success in providing quality health services. This research also reveals the factors that influence the quality of service and excellent service and provides recommendations for improving both.

4.2 The Influence of Talent Management, Leadership, and Organizational Culture on Quality Service

The Talent Management variable has a positive and significant effect on the Quality of Service variable. It is proven that the t-value is 7.32 > 1.96. This condition can be interpreted as meaning that a positive coefficient value encourages a significant and strong influence between the two variables above. This research is in accordance with previous research by Khalood and Nor (2023), in accordance with the theory put forward by Groves in Hermin (2013) Talent Management is generally related to training on development strategies, identifying talent gaps, succession planning, as well as recruiting, selecting, educating, 150 motivating and nurturing talented employees through various initiatives.

The Leadership variable has a positive and significant effect on the Quality of Service variable. This condition can be interpreted as meaning that a positive coefficient value encourages a significant and strong influence between the two variables above. This research is in accordance with previous researchers, Darwin (2020), that leadership influences the quality of service. This research is in accordance with the theory put forward by Asmuji (2013) that quality leadership can be said to be the main source of good and bad quality nursing service through the implementation of an effective quality management system.

The Organizational Culture variable has a positive and significant effect on the Quality of Service variable. This condition can be interpreted as meaning that a positive coefficient value encourages a significant and strong influence between the two variables above. This research is in accordance with previous researcher Radito Soesanto (2023) who stated that organizational culture influences the quality of service. This research is in accordance with the theory put forward by Osborne and Plastrik (2000) The attitudes and behaviors that emerge in an organization describe the organization's culture.

Based on the research results and overall discussion, it is concluded that talent management, leadership, organizational culture, and quality of service have a positive and significant influence on excellent service at

Bhayangkara Hospital. Talent management, servant leadership, and a strong organizational culture can improve service quality and employee satisfaction, while improving the quality of service also contributes to achieving excellent service. Strategies involving employee development and talent management, along with quality leadership and a positive organizational culture, have a positive impact on the quality of service at the hospital. The results of this research provide a clear picture of the importance of factors such as talent management, leadership, organizational culture, and quality of service in improving excellent service at Bhayangkara Hospital. Based on the research results, it can be concluded that the Bhayangkara Polri Hospital will gain great benefits by optimizing the implementation of talent management, leadership, organizational culture, and quality of service. Implementation of strategies that focus on talent management, servant leadership, a positive organizational culture, and improving the quality of service will contribute positively to achieving excellent service at the hospital. Improved service quality and employee satisfaction, together with improvements in quality of service, would be outcomes that can be expected from the holistic application of these factors.

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Evaluation of National Character in 53 Countries Based on the Social Capital Concepts

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Abstract
The purpose of this study is to measure the national character of the 1990s and 2000s, and compare the changes in their measurements in order to propose that national character changes with the times. This study focuses on 53 countries around the world. National character is defined by the concept of social capital, characterized by three components. Using the data from the World Values Survey, factor analysis and structural equation models measure six factors of national character, which relates to three components of social capital concepts. The changes in national character are evaluated by the comparison of the values and differences in population means between the answers to questions in the 1990s and the 2000s. This study finds that the measurements of six factors have changed from 1990s to 2000s. By comparing the 1990s and the 2000s, the results of measurements show that each factor of national character changes with the times. This implies that the measurements of national character used in previous studies may not always adequately represent the current situation in each country.

Keywords: Comparative Study, International Accounting, National Character, Social Capital

1. Introduction

Recently, many countries have adopted the International Financial Reporting Standards (IFRS) for the preparation of financial statements. The International Accounting Standards Board (IASB) asserts that the application of IFRS provides transparent and comparative information for users. However, various environmental factors have influenced the development of accounting systems through differences in national character, resulting in variations among business activities and accounting practices. Therefore, even when financial statements are prepared in accordance with de facto standards like IFRS, it may still be challenging to compare financial information among firms in different countries.

This study aims to measure national character in 53 countries for use in the analysis of international comparative accounting research. For a long time, it was believed that national character would remain constant over time. Previous research relied on measures of national character surveyed in the late 1960s and early 1970s. In contrast,

this study measures national character in many countries using survey results from the 1990s to the 2000s and assesses whether national character undergoes changes.

The study focuses on countries that were surveyed at least once in the 1990s and 2000s by the World Values Survey Association (WVSA). WVSA has been conducting the World Values Survey (WVS) since 1980 and has published seven survey rounds to date. National character is measured using WVS data, and both factor analysis and structural equation modeling (SEM) are employed. Changes in national character are assessed by evaluating the measurements and ranks of their constituents in each country, as well as by testing differences in population means between responses to each question in the 1990s and 2000s.

The study reveals that national characters in many countries undergo changes between the 1990s and the 2000s. This contributes to the provision of new measurements of national character for examining international comparative and time-series accounting research.

The remainder of this paper is organized as follows. Section 2 discusses previous research related to national character, with a focus on culture, and reviews accounting literature that examines the effects of cultural dimensions on financial information. Next, Section 3 outlines the materials and research design for measuring national character. Section 4 presents descriptive statistics for adjusted questionnaire data and the results of measuring national character in each country. Finally, Section 5 provides some conclusions and discusses the implications of this paper.

2. Prior Research

2.1 Surveys of Cultural Values

The study of nationhood has a long history in the field of anthropology (Benedict, 1934; Kardiner, 1939; Linton, 1945). The term national character has rarely been defined and has been used in a variety of ways. According to Inkeles (1997), many previous studies have pointed to a common denominator, "a common or standardized characteristic of a particular society." This is a useful concept in the pursuit of understanding the causes and consequences of social systems created by humans.

In the field of accounting, Gray (1988) demonstrates that culture significantly influences the development of accounting systems and delves into the extent to which cultural factors can explain and predict international variations in accounting practices. Furthermore, Gray (1988) proposes a theory of cultural influence on the development of accounting systems through international comparisons based on societal values identified by Hofstede (1980; 1984). Since then, during the 1990s, numerous researchers have empirically analyzed Gray's theoretical model[i)].

Hofstede (1980) focuses on academicians and challenges previous theoretical studies in psychology, organizational sociology, and management and conducts a questionnaire survey of approximately 110,000 employees in 40 countries[ii)] at IBM Co. (Hermes in the book), a multinational corporation with subsidiaries all over the world, around 1967 and 1973. Hofstede (1980) reveals that organizations are constrained by culture by conducting surveys and detecting similarities and differences in the national cultures of the world's major countries. In the study, four factors that constitute culture are presented as social values: Power Distance, Uncertainty Avoidance, Individualism & Collectivism, and Masculinity & Femininity. The social value is measured by country.

Hofstede (2001) was published as a revised version of Hofstede (1980) in response to the rapid changes in politics, business and the way of thinking (idea) since Hofstede (1980). Hofstede (2001) covers 50 countries by adding 10 countries to the 40 covered in Hofstede (1980).

The social values are presented as five, with the addition of Long- Versus Short-Term Orientation to the four social values of Hofstede (1980). However, the measures of social values in Hofstede (2001) remain unchanged for the

four social values of Hofstede (1980) and are added only for the ten newly included countries. The new social values, "long-term and short-term orientation," were measured based on the China Values Survey (CVS) conducted by Hong Kong scholar Bond (Bond, Michael Harris) in 1985[iii] and the European Media Marketing Survey (EMMS)[iv] in 1997. While Hofstede (1980) measured four social values based on a survey conducted on IBM's employees in 40 countries, the fifth social value was measured based on a different survey.

In 2010, Hofstede et al. (2010) were published along with his son (Gert Jan Hofstede) and Minkov (Michael), who are familiar with the cultures of Eastern European countries, as co-authors. Hofstede et al. (2010) introduced "Indulgence Versus Restraint" as the sixth social value to the five social values of Hofstede (2001).

Hofstede et al. (2010) surveyed 78 countries and territories (collectively “countries")[v] for Hofstede's (1980) four social values, and 96 countries[vi] for the remaining two social values. However, for Hofstede's (1980) four social values, the findings for 50 out of the 78 countries remain consistent with those from Hofstede (1980) and Hofstede (2001). Long-Term Versus Short-Term Orientation and Indulgence Versus Restraint were measured using the WVSA's WVS and not based on a survey of IBM employees.

Similar to Hofstede's cross-cultural study, the Global Leadership & Organizational Behavior Effectiveness (GLOBE) project conducted a study involving 62 countries, and also conducted surveys in 2008 and 2014. The surveys in 2008 and 2014 of GLOBE employed both qualitative and quantitative analysis methods, but the number of countries surveyed decreased from 62 countries in 2004 to 25 in the 2008 study and 24 in the 2014 study.

GLOBE extends Hofstede's (2001) five social values to measure national characteristics using nine cultural dimensions and to study the expected leadership behaviors in each country based on characteristics. The nine cultural dimensions are Performance Orientation, Assertiveness, Future Orientation, Humane Orientation, Institutional Collectivism, In-Group Collectivism, Gender Egalitarianism, Power Distance, and Uncertainty Avoidance (House et al., 2004[vii]). Some of the items in the GLOBE cultural dimensions are identical or similar to Hofstede's societal values.

The Hofstede and GLOBE studies are similar in that they both assess national characteristics from a cultural perspective and find that the characteristics of each country influence organizational behavior. These studies are also considered important in studying the attributes of financial information prepared and disclosed under management’s responsibility. On the other hand, a number of inconsistencies can be pointed out between Hofstede's measurement results on societal values and GLOBE's measurement results on cultural dimensions. These differences, whether they pertain to societal values or cultural dimensions, pose challenges in terms of the reliability of the measurement results.

The studies by Hofstede and GLOBE are similar in that both assess national character based on culture and find that the national character of each country affects organizational behavior. These studies contribute to the examination of the attributes of financial information prepared and disclosed by management. However, the results of measuring certain cultural dimensions, such as uncertainty avoidance and institutional collectivism, diverge from the societal values that Hofstede labels as uncertainty avoidance and collectivism. Discrepancies in the measurements of the same or similar dimensions raise some questions about the findings of these studies.

2.2 Surveys of Social Capital

Other studies have evaluated national character using the concept of social capital derived from social theory. The concept of social capital is the broad idea that social relationships are resources that help people act effectively (Dasgupta & Serageldin, 1999). Various researchers offer different definitions of social capital. Putnam (1993) defines social capital as the features of social organizations, such as trust, norms, and networks, that can improve the efficiency of society by facilitating coordinated actions. Since then, many studies have used trust, norms, and networks as the three elements of social capital.

Putnam (1993) divides trust into two categories: thick trust and social trust. Thick trust refers to beliefs that arise from intimate relationships with individuals. Social trust refers to general trust relationships with other members of the wider community. Social trust helps to develop the social capital of an area because it generates broader cooperation with other members of that area. In a complex environment such as the modern one, social trust can come from norms of reciprocity and networks of civic participation.

Among the different types of norms, Putnam (1993) pays particular attention to the norm of reciprocity. The norm of reciprocity is interdependent exchange, which is classified into balanced reciprocity and generalized reciprocity. The norm of balanced reciprocity is the simultaneous exchange of equivalent items. The norm of generalized reciprocity is a persistent relationship of exchange based on the mutual expectation that, at a certain point in time, the exchange is unbalanced, but in the future, equilibrium will be achieved. The norm of generalized reciprocity is based on altruism, which would provide utility to others in the short run, and selfishness, which would enhance the utility of all parties in the long run. Thus, the generalized norm of reciprocity is a highly productive component of social capital.

Putnam classifies civic engagement networks into horizontal networks and vertical networks. Horizontal networks refer to the everyday ties of individuals and the range of their mutual activities. Vertical networks relate to the degree of hierarchical and subordinate ties to the community and organization, such as community activities and the formation of various organizations. For example, vertical networks are less reliable than horizontal networks because subordinates in organizations do not like to be exploited and protect themselves by not disclosing much information.

Putnam thus divides social capital into trust, norms, and networks and points out that these concepts can be further classified and interpreted. Social capital has attracted much attention in the field of social sciences such as economics and business administration, and is used to explain the economic development of countries and corporate behavior[viii)].

Many organizations have conducted surveys and analyses of social capital with various purposes. The Institute of Statistical Mathematics (ISM) in Japan has been conducting the "International Comparison of Attitudes" survey since 1953, when it conducted a survey on the Japanese national character. ISM published a comprehensive report based on 54 basic questions for nine countries in 2015.

In order to analyze the relationship between economic development and social capital, the Organisation for Economic Co-operation and Development (OECD) has examined methods for surveying and measuring social capital (Healy & Cote, 2001; Scrivens & Smith, 2013). Scrivens & Smith (2013) provide four interpretations of social capital, such as (i) personal relationships, (ii) social network support, (iii) civic engagement, and (iv) trust and cooperation norms, along with associated survey questions, although no measurements have been conducted to date.

The World Bank has been conducting research and analysis on the relationship between social capital and economic disparity using quantitative and qualitative analytical methods to develop social capital for the purpose of poverty eradication and sustainable economic growth.

Grootaert & van Bastelaer (2002) developed the methods for investigating social capital by categorizing social capital into three categories: (i) the relationships and the networks, (ii) the trust and the adherence to norms, and (iii) the collective action. In a result, the Social Capital Assessment Tool (SOCAT) was proposed as an evaluation tool that establishes guidelines for conducting household surveys, community surveys, and organizational surveys.

Grootaert and Narayan (2004) have developed the Integrated Questionnaire for the Measurement of Social Capital (SC-IQ) as a tool to assess social capital focusing on household surveys in developing countries. This is a questionnaire-based measurement of social capital divided into six categories: (i) groups and networks, (ii) trust and cooperation, (iii) collective action and cooperation, (iv) information and communication, (v) social cohesion and

cohesion, and (vi) power and political activity. The World Bank has been conducting pilot tests using these assessment tools, but has not released the results of the measurements for all countries in the world.

The International Social Survey Program (ISSP) which was established by a joint initiative of the United Kingdom, Australia, Germany and the United States, now has 57 member-countries. ISSP conducts fundamental studies and research on important topics in the social sciences[ix]. The ISSP has surveyed around 50,000 people in 30 to 40 countries on 11 topics, with a relatively small number of questions, approximately 30, on each topic.

While, in many social capital surveys, there are problems such as the small number of surveyed countries and questions, and the lack of measurement, WVSA is the organization that conducts the largest number of surveys on social capital in terms of countries covered, scope of questions, and number of questions.

The WVSA, an organization consisting of sociologists from around the world, performs the WVS to study changes in the attitudes of people in different countries and their impact on social, cultural, and political activities. The WVS has been started since the first survey (Wave 1) in 1981, and the seventh survey (Wave 7) was delayed due to COVID-19 but completed in 2022, with more than 400,000 participants from 100 countries, representing about 90% of the world's population. The Wave 6 survey covered 61 countries and was based on 262 questions related to a wide range of political, economic, labor, religious, family, social, environmental, and international issues. WVS is noteworthy for assessing the national character because it encompasses the largest number of countries and the broadest range of perspectives.

The survey provides various information on the abstract concept such as social capital, with the characteristics of big data that has recently much attention (Mukai, 2017b). The WVS has also been used, in part, to measure social values in Hofstede (2001) and Hofstede et al. (2010), as well as to validate the results of the GLOBE survey. This is useful for expanding and developing research that evaluates national character from a cultural perspective.

Mukai (2017a; 2017b; 2017c) emphasized the importance of assessing national characteristics and the suitability of utilizing the WVS to measure them, building on the previous studies mentioned above. Mukai (2019) assesses national character in about seven countries, using the data of Wave 6 (2010-2014) in WVS. However, because the purpose of his research is to develop the research framework for using international accounting study, Mukai (2019) focused on relatively economically developed countries. As a result, the differences in national character from the global level are not found. Therefore, by expanding the survey countries and the survey year of the questionnaire used, this paper provides an assessment of how the national character of many countries has changed over time and in its current state.

3. Materials and Method

3.1 Data and Samples

Many international comparative studies have used the societal values published in a series of Hofstede's research to examine the effect of cultural differences on accounting systems. These scores have been adjusted on a scale from 0 to 100 based on the average responses to questions and the results of factor analysis. However, the questions and their answers were surveyed in the late 1960s and early 1970s and have been not updated. This study examines whether national character has changed over time and, if so, how it has changed.

This study measures national character using the data from Wave 3 to Wave 6, which includes an expanded set of countries. In total, 101 countries are surveyed across Wave 3 to Wave 6, with an average of 2.15 surveys per country. To investigate as many countries as possible, Wave 3 and Wave 4 (Wave 3 & 4) and Wave 5 and Wave 6 (Wave 5 & 6) were each aggregated to reveal the measurement and change of national character at different times. The total countries surveyed are 73[x]) for Waves 3 & 4 and 80[xi]) for Waves 5 & 6. Wave 3 & 4 is a questionnaire survey conducted from 1995 to 2004. National character is called "the national character of the 1990s". Waves 5 & 6 is a questionnaire survey conducted from 2005 to 2014. National character is called "the national character of the 2000s".

The number of countries surveyed in both Wave 3 & 4 and Wave 5 & 6 was 53. There are a total of 528 questions asked from Wave3 to Wave6. Wave 3 through Wave 6 have 88 common questions, 51 of which were answered by all 53 countries. Among these questions, 44 questions were answered on the Likert scale.

3.2 Research Design

National character in the 1990s and 2000s are measured by the following procedure.

i) Select a country where the national characteristics of the 1990s and the 2000s can be compared by conducting a questionnaire survey at least once in Waves 3 & 4 and Waves 5 & 6.
ii) Select the questions that are answered on the Likert scale from all the questionnaire surveys from Wave 3 to Wave 6.
iii) Sort all answers in the order of lower rating, since there were differences in the order of the Likert scale for responding.
iv) Select factors for measuring national character by factor analysis using the answers to all questions from Wave 3 to Wave 6. The factor analysis uses the maximum likelihood method [xii]) and the varimax rotation[xiii]).
v) Exclude questions with low commonality, less than 0.2, as a result of factor analysis. Then, perform factor analysis again to select the questions that measure national character.
vi) Name each factor as representing the contents of questions, assuming that each factor extracted as a result of factor analysis constitutes national character.
vii) Draw a path diagram for SEM for each factor.
viii) Perform SEM based on the drawn path diagram, using answers to selected questions in Waves 3 and 4 related to measuring national character in the 1990s, and in Waves 5 and 6 related to measuring national character in the 2000s.
ix) Measure each national character in the 1990s and 2000s by inputting the average of the answers to the questions for each country into the equation using the unstandardized coefficient and residuals calculated by SEM.

Next, the following two methods will be used to verify whether the national character has changed over time.

i) Test the differences in the population means between the answers to common questions in Waves 3 & 4 and Waves 5 & 6.
ii) Evaluate the magnitude of changes and the changes in ranking regarding the measurements of each factor in Waves 3 & 4 and Waves 5 & 6.

4. Descriptive Statistics and Results

Factor analysis based on responses to 44 questions from Wave 3 to Wave 6 excluded question items with low commonality. There were 30 questions that use to measure national character. The descriptive statistics by country and item for 30 questions in Waves 3 & 4 and Waves 5 & 6 are omitted here.

Table 1 shows the results of factor analysis. Factor analysis finds six factors for constitute national character. As a result of scrutinizing the results of factor analysis, each factor relates to 'trust," "norms," and "networks" that constitute national character in the social capital concepts.

Table 1: Results of Factor Analysis

No.	Ques. No.	Trust in Social Systems	Norms for Life and Sex	Religious Spirits	Norms for Law and Discipline	Happiness from a Calm Society	Motivation to Political Activities

1	E06902	0.435	0.078	0.099	0.059	0.029	-0.006
2	E06905	0.533	0.026	0.010	-0.029	0.003	0.067
3	E06906	0.572	-0.058	-0.024	0.094	0.081	0.011
4	E06907	0.825	0.024	-0.005	0.013	0.011	-0.016
5	E06908	0.692	0.051	0.025	0.011	0.006	0.004
6	E06911	0.754	0.039	0.017	0.024	0.037	-0.075
7	E06912	0.745	0.046	0.009	-0.026	0.018	0.004
8	E06913	0.489	0.023	0.079	-0.018	0.081	-0.010
9	E06920	0.423	-0.043	0.019	-0.016	0.036	0.040
10	F118	0.015	0.691	0.149	0.091	-0.146	-0.152
11	F119	0.046	0.667	0.097	0.241	-0.070	-0.058
12	F120	0.010	0.706	0.279	0.097	0.034	-0.115
13	F121	0.068	0.697	0.184	0.027	-0.010	-0.132
14	F122	0.052	0.578	0.274	0.107	-0.009	-0.112
15	F123	-0.011	0.535	0.140	0.267	-0.013	-0.073
16	A006	0.046	0.233	0.784	-0.004	0.014	-0.067
17	E06901	0.217	0.174	0.613	-0.026	0.010	-0.066
18	F028	0.039	0.196	0.641	-0.035	0.055	-0.004
19	F034	-0.010	0.104	0.671	0.011	-0.009	-0.037
20	F063	-0.009	0.221	0.762	0.006	0.054	-0.090
21	F114	0.021	0.063	-0.020	0.603	0.002	0.046
22	F115	0.045	0.132	0.000	0.668	0.013	-0.008
23	F116	0.038	0.158	0.030	0.714	0.064	-0.019
24	F117	-0.028	0.181	-0.053	0.663	0.018	0.055
25	A008	0.089	-0.012	0.076	0.037	0.539	0.027
26	A170	0.045	-0.063	0.010	0.023	0.841	0.028
27	C006	0.095	-0.067	-0.008	0.016	0.662	0.018
28	E025	-0.004	-0.229	-0.096	0.090	0.118	0.653
29	E026	0.048	-0.126	-0.068	0.013	0.001	0.719
30	E027	0.008	-0.113	-0.046	-0.012	-0.015	0.661

SEM is performed on the extracted factors by factor analysis and finds unstandardized coefficients and residuals for representing the relationship among questions. Panels A to F in FIGURE 1 show the path diagrams for performing SEM and the results of analyses. Each component of national character is measured by substituting the average value of the answers to each question into the SEM result. Panels A to F in Table 2 (at the end of this section) show the scores of factors, their rankings and changes in each country between Waves 3 & 4 and Waves 5 & 6.

Comparing the 1990s and 2000s for scores of each factor, in many countries, the measurements of "trust in social systems," "norms for life and sex," and " happiness from a calm society (security)" have increased, and the measurements of the "religious spirits (godliness)," "norms for law and discipline," and “motivation to political activities” have decreased. These scores and their changes represent the country’s and regional characteristics.

“Trust in social systems” is measured by trust in various organizations with a certain purpose, including public services. In both the 1990s and 2000s, measurements of "trust in social systems" show high scores in Asian countries such as Vietnam, China, India, and the Philippines, and Nordic countries such as Norway and Sweden. They were low scores in South American countries such as Mexico, Argentina, and Peru, and in Eastern European countries such as Romania and Serbia.

"Norms for life and sex" is measured from the perspective of the value of life and the discipline of sexual activity. In both eras, the measurements of "norms for life and sex" were high in Middle Eastern countries such as Jordan and Iran, Asian countries such as Pakistan, Indonesia and Vietnam, and African countries such as Egypt, Nigeria,

Zimbabwe and Morocco. They showed low scores in Nordic countries such as Finland, Norway and Sweden, European countries such as Germany, United Kingdom, Spain and Switzerland, and Oceania countries such as New Zealand and Australia.

“Religious spirits" is measured from the degree of devotion, including participation in daily religious activities. The measurements of "religious spirits" were high in African countries such as Morocco, Nigeria, Zimbabwe and Egypt, and in Asian countries such as Indonesia, the Philippines and Pakistan. They were low in Asian countries such as Vietnam, Japan and China, and European countries such as Germany and Estonia, including Nordic countries such as Sweden and Norway.

"Norms for law and discipline" are measured from the perspective of justifying illegal activities. The measurements of "norms for law and discipline" are high in countries such as Japan, Morocco, Jordan, Australia, Pakistan, Egypt, Vietnam, and low in the former Soviet Union countries such as Ukraine, Belarus and Moldova in both the 1990s and 2000s.

"Happiness from a calm society (security)" is measured from the satisfaction of one's life. In both the 1990s and 2000s, the measurements of " happiness from a calm society " show high scores in South American countries such as Mexico and Colombia, Nordic countries such as Sweden, Norway, and Finland, as well as European countries such as Switzerland and the UK. They were low in the former Soviet Union countries such as Belarus, Moldova, Ukraine, Armenia, Georgia and Russia.

"Motivation to political activities" is measured from participation in political activities as a group using horizontal networks. Measures of "motivation to political activities" were measured in both the 1990s and 2000s, including Nordic countries such as Sweden, Norway and Finland, European countries such as the UK and Germany, Oceania countries such as New Zealand and Australia, North American countries such as the US and Canada. They were low in the former Soviet Union countries such as Azerbaijan and Kyrgyz, and Asian countries such as the Philippines and Vietnam.

Each factor of national character changes from the 1990s to the 2000s as followings.

From the 1990s to the 2000s, indexes of “trust in social systems” have increased in about 90% of the surveyed countries and this reveals that the relationship between the people and the social system is improving. However, the measurements of “trust in social systems” in countries such as Taiwan, Iraq, Hungary, Moldova and Egypt have declined. Among the countries surveyed, there are more than 10 ranking changes in 20 countries, mainly in the former Soviet Union. Among the former Soviet Union countries, Kyrgyz has moved up the ranks of 30, and Azerbaijan and Estonia have also risen ranking significantly. On the contrary, Moldova and Ukraine have greatly lowered their ranks. In addition, the ranks of Eastern European countries such as Hungary and Poland have also declined, particularly with Iraq and Egypt having large declines in measured values, and their rankings have fallen to about 40th.

In the 2000s, “norms for life and sex” measurements increased in about 70% of the countries surveyed compared to the 1990s, indicating a shift in thinking about life's dignity and gender discrimination. In the ranking of the countries surveyed, the former Soviet Union countries such as Armenia, Azerbaijan, Belarus and Estonia showed a rise of more than 10th rank. In the 2000s, the former Soviet Union countries occupied four countries in the top ten. On the other hand, the measurements in African countries such as Algeria and South Africa, South American countries such as Brazil and Chile, and Asian countries such as Singapore and Taiwan have been declining, and their ranks have fallen by more than 10th.

Regarding "religious spirits" in the 2000s, the measured value has decreased in about 85% of the surveyed countries compared to the 1990s, and the religious spirits have decreased. Among the countries surveyed, there was no significant change in the countries included in the top 10 countries and the bottom 10 countries. It was in Eastern European countries such as Romania, Poland, and Serbia, including former Soviet Union countries such

as Georgia, Armenia, and Ukraine, that the measurements increased and ranks increased. On the other hand, the measurements in the UK dropped the most, and the rank also dropped more than 40th place.

In the 2000s, the measurements of "norms for law and discipline" decreased in about 70% of the surveyed countries compared to the 1990s, and the norms for law and discipline decreased. In the ranking of the countries surveyed, there are more than 10 ranking changes in 23 countries. " Norms for law and discipline" of the former Soviet Union were generally low ranked in the 1990s, but in the 2000s Azerbaijan ranked first and Georgia and Armenia ranked in the top 10. In addition, European countries such as Switzerland and Germany, including Eastern European countries such as Romania and Hungary, have greatly increased their ranks. On the other hand, Asian countries such as Pakistan, Vietnam, South Korea, India, Singapore, and the Philippines, and African countries such as Zimbabwe, South Africa, and Algeria have fallen in the measurements and their ranks have dropped significantly.

In the 2000s, compared to the 1990s, the measured values of "happiness from a calm society" increased in all countries except Britain, and the sense of well-being is increasing worldwide. Pakistan has risen the most in the measurements, rising from 45th rank to 12th rank. The former Soviet Union countries still have low measurements in both the 1990s and 2000s, while the measurements in Armenia and Georgia have increased, but their ranks have declined.

Regarding the "motivation to political activities" in the 2000s, the measurements decreased in about 65% of the surveyed countries compared to the 1990s. The willingness to actively participate in political activities is declining. Relatively large increases in measurements have been made in European countries such as Switzerland, Serbia and Spain and countries such as Argentina and Pakistan. Meanwhile, Egypt's measurements fell sharply, dropping from 21st in the 1990s to 50th in the 2000s. Other than that, including the former Soviet Union countries such as Ukraine and Kyrgyz, the measurements of Eastern European countries such as Romania and Hungary have fallen sharply, and their ranks have dropped significantly.

Therefore, the test of the differences in the population means was performed by using the answers to the questions in Waves 3 & 4 and Waves 5 & 6 to examine whether national character changes with the times. The results of tests for differences in population means of answers to questions in Waves 3 & 4 and Waves 5 & 6, showed statistically significant for each country and region.

Table 2: Measures and Changes in Factors of National Character

		Trust in Social Systems				Norms for Life and Sex				Religious Spirits			
		1990s		2000s		1990s		2000s		1990s		2000s	
Country	Region	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
Algeria	Africa	4.037	43	4.178	46	17.758	8	17.414	20	8.149	19	8.128	11
Egypt	Africa	4.281	9	4.042	52	17.890	6	18.618	7	8.497	8	8.213	9
Morocco	Africa	3.978	47	4.372	24	17.580	10	18.214	15	8.353	11	8.598	1
Nigeria	Africa	4.255	13	4.401	20	17.841	7	18.491	8	8.787	2	8.542	2
South Africa	Africa	4.280	10	4.424	18	16.912	18	16.476	33	8.405	10	8.087	14
Zimbabwe	Africa	4.369	5	4.468	14	18.383	2	18.419	11	8.554	6	8.437	4
China	Asia	4.538	2	4.810	2	16.740	21	18.047	17	6.269	53	6.267	54
India	Asia	4.301	7	4.600	4	16.951	14	18.071	16	8.128	20	8.190	10
Indonesia	Asia	4.235	17	4.434	16	18.350	3	18.992	3	8.709	3	8.444	3
Japan	Asia	4.130	30	4.354	26	15.378	40	15.807	38	6.799	52	6.564	53
Pakistan	Asia	4.138	29	4.244	36	18.434	1	19.034	2	8.700	4	8.421	6
Philippines	Asia	4.395	4	4.569	6	16.580	24	16.735	28	8.588	5	8.429	5
Singapore	Asia	---	---	4.703	3	17.008	13	16.734	29	8.172	18	7.598	26
South Korea	Asia	4.195	22	4.372	23	16.372	29	16.733	30	7.103	47	7.043	38

Taiwan	Asia	4.280	11	4.260	32	16.694	22	16.360	34	7.420	36	7.017	39
Viet Nam	Asia	4.737	1	5.193	1	17.601	9	18.401	12	6.933	49	6.848	46
Armenia	Europe	4.070	37	4.259	33	16.379	27	18.840	4	7.710	30	7.957	20
Azerbaijan	Europe	4.166	25	4.497	9	16.921	16	18.622	6	7.954	26	7.305	33
Belarus	Europe	4.217	20	4.457	15	15.901	34	17.408	21	7.540	32	7.391	32
Bulgaria	Europe	4.221	19	4.236	39	15.785	36	15.727	40	7.233	43	7.227	34
Estonia	Europe	4.176	23	4.488	11	15.615	38	16.862	27	7.001	48	6.775	49
Finland	Europe	4.225	18	4.570	5	14.825	45	15.110	44	7.329	38	7.195	36
France	Europe	---	---	4.291	29	---	---	14.465	50	---	---	6.746	50
Georgia	Europe	4.079	36	4.261	31	17.059	12	18.786	5	8.036	24	8.241	8
Germany	Europe	4.029	45	4.275	30	14.002	50	15.104	45	6.824	51	6.732	51
Hungary	Europe	4.116	33	4.108	48	15.201	41	16.213	35	7.169	45	6.969	42
Kyrgyzstan	Europe	4.053	40	4.495	10	17.318	11	18.452	9	7.825	28	7.704	24
Moldova	Europe	4.127	31	4.062	49	16.777	20	17.399	22	7.955	25	7.732	23
Norway	Europe	4.353	6	4.564	7	14.973	44	14.272	52	7.121	46	6.778	47
Poland	Europe	4.171	24	4.192	44	16.628	23	17.153	24	7.629	31	7.970	19
Romania	Europe	4.069	38	4.202	41	16.244	30	17.920	18	8.077	21	8.084	15
Russian Federation	Europe	4.045	41	4.236	38	16.148	31	16.621	32	7.275	42	7.219	35
Serbia	Europe	3.963	49	4.055	50	16.130	32	15.269	42	7.452	35	7.574	27
Slovenia	Europe	4.024	46	4.054	51	14.995	43	14.681	48	7.322	40	6.994	41
Spain	Europe	4.098	34	4.254	34	14.732	47	14.640	49	7.483	33	6.777	48
Sweden	Europe	4.243	16	4.477	12	13.301	52	13.506	54	6.904	50	6.597	52
Switzerland	Europe	4.125	32	4.432	17	14.080	49	13.968	53	7.328	39	7.149	37
Ukraine	Europe	4.139	28	4.192	43	16.376	28	16.936	26	7.479	34	7.562	28
United Kingdom	Europe	---	---	4.336	27	13.535	51	14.921	47	9.569	1	6.964	43
Iran	M.E.	4.043	42	4.361	25	18.002	5	18.435	10	8.515	7	8.107	13
Iraq	M.E.	4.288	8	4.126	47	15.893	35	18.273	14	8.294	14	8.019	17
Jordan	M.E.	4.448	3	4.529	8	18.242	4	19.214	1	8.453	9	8.322	7
Turkey	M.E.	4.263	12	4.474	13	---	---	18.378	13	8.076	22	7.943	21
Canada	N.America	4.244	15	4.419	19	15.026	42	15.624	41	7.768	29	7.484	30
United States	N.America	4.249	14	4.320	28	15.723	37	15.752	39	8.176	17	7.613	25
Australia	Oceania	4.156	27	4.387	22	14.810	46	14.421	51	7.291	41	6.865	45
New Zealand	Oceania	4.083	35	4.388	21	14.667	48	14.982	46	7.174	44	6.880	44
Argentina	S.America	3.776	51	3.939	54	15.977	33	15.859	37	7.885	27	7.400	31
Brazil	S.America	4.200	21	4.251	35	16.936	15	17.078	25	8.329	13	8.050	16
Chile	S.America	4.164	26	4.240	37	16.473	26	16.188	36	8.046	23	7.516	29
Colombia	S.America	3.963	48	4.218	40	16.843	19	17.751	19	8.341	12	8.110	12
Mexico	S.America	4.031	44	4.190	45	16.547	25	16.681	31	8.215	16	7.983	18
Peru	S.America	3.933	50	3.939	53	16.913	17	17.344	23	8.293	15	7.903	22
Uruguay	S.America	4.061	39	4.200	42	15.473	39	15.239	43	7.338	37	6.994	40
AVE.		4.172		4.341		16.287		16.790		7.811		7.549	
StDEV.		0.161		0.217		1.261		1.547		0.645		0.622	

		Norms for Law and Discipline				Happiness from a Calm Society				Motivation to Participate in Political Activities			
		1990s		2000s		1990s		2000s		1990s		2000s	
Country	Region	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
Algeria	Africa	17.270	32	15.796	52	7.327	35	8.051	37	3.404	26	3.354	25

Egypt	Africa	17.918	7	17.553	15	7.169	39	7.712	49	3.486	21	2.897	50
Morocco	Africa	17.954	5	17.666	7	7.341	34	7.745	48	3.320	34	3.178	40
Nigeria	Africa	17.444	26	17.165	32	7.658	22	7.976	39	3.338	32	3.271	33
South Africa	Africa	17.331	30	15.981	51	7.419	32	8.250	28	3.480	22	3.418	22
Zimbabwe	Africa	17.946	6	17.023	37	6.571	53	7.833	44	3.247	41	3.314	28
China	Asia	17.808	8	16.995	38	7.672	20	8.228	31	---	---	3.239	35
India	Asia	17.563	18	17.199	31	7.349	33	8.005	38	3.609	14	3.465	18
Indonesia	Asia	17.373	28	17.734	5	7.782	15	8.256	26	3.154	46	3.226	37
Japan	Asia	17.753	9	17.824	4	7.625	23	8.252	27	3.801	10	3.570	16
Pakistan	Asia	18.142	2	17.561	14	6.908	45	8.490	12	3.016	49	3.312	29
Philippines	Asia	16.123	49	15.348	53	7.665	21	8.395	18	3.121	48	3.085	44
Singapore	Asia	17.242	33	16.660	45	7.880	12	8.288	23	3.137	47	---	---
South Korea	Asia	17.537	19	17.216	29	7.493	30	8.092	36	3.824	9	3.671	12
Taiwan	Asia	17.496	20	17.261	26	7.622	24	8.222	33	3.260	39	3.161	42
Viet Nam	Asia	17.961	4	17.516	16	7.584	25	8.332	21	3.182	45	2.992	48
Armenia	Europe	16.438	46	17.636	9	6.736	49	7.519	53	3.515	18	3.019	46
Azerbaijan	Europe	16.546	44	17.967	1	7.141	42	8.153	34	3.195	43	2.862	51
Belarus	Europe	16.450	45	16.547	47	6.728	50	7.784	46	3.295	37	---	---
Bulgaria	Europe	17.461	24	17.253	27	6.850	46	7.528	52	3.303	36	3.239	36
Estonia	Europe	17.103	35	17.026	36	6.979	43	7.958	41	3.453	25	3.279	32
Finland	Europe	17.466	23	17.420	18	8.069	6	8.644	5	3.710	12	3.753	11
France	Europe	---	---	16.709	44	---	---	8.223	32	---	---	3.972	8
Georgia	Europe	17.013	38	17.825	3	6.808	47	7.487	54	3.192	44	3.201	38
Germany	Europe	17.018	36	17.484	17	7.765	16	8.354	19	3.976	6	3.788	10
Hungary	Europe	16.283	48	17.239	28	7.323	36	7.808	45	3.499	19	3.067	45
Kyrgyzstan	Europe	16.977	39	16.728	43	7.575	26	8.281	24	3.216	42	2.999	47
Moldova	Europe	16.106	50	16.378	49	6.678	51	7.690	50	3.260	40	3.320	27
Norway	Europe	17.638	14	17.411	19	8.030	7	8.707	4	4.035	4	4.059	3
Poland	Europe	17.495	21	17.285	25	7.463	31	8.230	30	3.373	29	3.416	23
Romania	Europe	17.418	27	17.590	11	6.932	44	7.959	40	3.471	24	3.169	41
Russian Federation	Europe	16.885	41	16.529	48	6.761	48	7.890	42	3.350	30	3.186	39
Serbia	Europe	17.452	25	14.840	54	7.166	40	7.858	43	3.530	16	3.668	13
Slovenia	Europe	16.851	42	17.134	33	7.557	28	8.397	17	3.550	15	3.546	17
Spain	Europe	17.577	17	17.403	20	7.697	19	8.267	25	3.497	20	3.645	14
Sweden	Europe	17.194	34	17.212	30	8.029	8	8.577	8	4.171	2	4.131	1
Switzerland	Europe	17.322	31	17.684	6	8.187	3	8.710	3	3.774	11	4.028	4
Ukraine	Europe	16.428	47	16.579	46	6.577	52	7.781	47	3.342	31	3.126	43
United Kingdom	Europe	---	---	17.326	23	8.604	1	8.498	11	4.372	1	3.880	9
Iran	M.E.	17.654	13	16.918	39	7.558	27	8.094	35	---	---	---	---
Iraq	M.E.	21.943	1	17.117	34	7.160	41	7.530	51	---	---	3.352	26
Jordan	M.E.	18.053	3	17.653	8	7.239	38	8.232	29	2.935	50	2.932	49
Turkey	M.E.	---	---	17.895	2	7.313	37	8.399	16	3.381	28	3.268	34
Canada	N.America	17.579	16	17.570	12	8.095	5	8.593	6	3.929	8	3.978	7
United States	N.America	17.664	12	17.397	21	8.011	10	8.405	15	3.984	5	3.986	6
Australia	Oceania	17.717	11	17.610	10	7.974	11	8.422	14	3.967	7	4.027	5
New Zealand	Oceania	17.587	15	17.561	13	8.023	9	8.591	7	4.120	3	4.088	2
Argentina	S.America	17.489	22	17.072	35	7.755	18	8.507	10	3.314	35	3.457	20

Brazil	S.America	15.973	51	16.773	41	7.785	14	8.515	9	3.691	13	3.609	15
Chile	S.America	16.916	40	16.830	40	7.758	17	8.349	20	3.289	38	3.299	31
Colombia	S.America	17.334	29	17.316	24	8.332	2	8.763	2	3.472	23	3.435	21
Mexico	S.America	16.579	43	16.165	50	8.132	4	8.803	1	3.385	27	3.354	24
Peru	S.America	17.016	37	16.744	42	7.515	29	8.288	22	3.516	17	3.463	19
Uruguay	S.America	17.727	10	17.386	22	7.869	13	8.484	13	3.323	33	3.299	30
AVE.		17.357		17.106		7.495		8.193		3.495		3.432	
StDEV.		0.848		0.626		0.485		0.344		0.318		0.345	

5. Conclusion

This study measures national character in 53 countries, for internationally comparing the characteristics of financial information prepared in accordance with IFRS. Previous studies have examined what kind of and how national character influences the development of accounting systems in different countries. Many studies refer to Hofstede's cross-cultural surveys to measure national character. However, the questions and their answers of a series of Hofstede's research were surveyed in the late of 1960s and early 1970s and have not been not upgraded data. Based on the WVS survey conducted in the 1990s and 2000s, six elements were proposed and measured as components of national character. This study evaluates that the components of national character are changing over time. This study finds the following.

The six factors of national character relate to the concepts of trust, norms and networks which constitute social capital. Trust was explained as "trust in the social systems" and "happiness from a calm society ". The norms were explained as "norms for life and sex", "religious spirits" and "norms for law and discipline". The network was described as "motivation to political activities".

The measurements of these components varied among different countries, and no single country exhibited consistently high or low values for all measurements. Also, the measurements of factors of national character significantly changed their ranks from the 1990s to the 2000s in many countries. Distinctive patterns in the measurements and their changes were observed within each region.

Specifically, "trust in the social systems" is high in Asian countries and Nordic countries, and low in South America and Eastern European countries. "Norms for life and sex" are high in the Middle East, Asian countries, and African countries, and low in European countries, including the Nordic countries, and Oceania. "Religious spirits" is high in African countries and Asian countries, and low in European countries including East Asian countries and Northern European countries. "Norms for law and discipline" is high in countries such as Japan, Morocco, Jordan, Australia, Pakistan, Egypt, and Vietnam, however regional characteristics are not found, and low in the former Soviet Union countries. "Norms for law and discipline" is high in countries such as Japan, Morocco, Jordan, Australia, Pakistan, Egypt, and Vietnam, however regional characteristics are not found, and low in the former Soviet Union countries. "Happiness from a calm society" is high in European countries including South America and Northern Europe, Oceania, and North America, and low in the former Soviet Union countries. "Motivation to political activities" was high in European countries including the Nordic countries, Oceania countries, and North American countries, and low in the former Soviet Union countries and Asian countries.

Comparing the 1990s and 2000s, the measurements of "trust in social systems", "norms for life and sex", and "happiness from a calm society" are increasing, however measurements of "religious spirits", "norms for law and discipline", and "motivation to political activities" are declining.

The rank of "trust in social systems" varied greatly in many countries. Especially in the former Soviet Union countries, there was a mixture of countries with a large increase in rank, such as Kyrgyz, and countries with a large decrease in rank. In the "norms for life and sex," former Soviet Union countries have risen in rank, and African and South American countries have fallen in rank. With regard to "religious spirits", the ranks of Eastern European countries, including the former Soviet Union countries, rose, but Britain fell significantly in both measurements and ranks. In the "norms for law and discipline", European countries such as Eastern European countries including

the former Soviet Union countries are ranked higher, and Asian countries and African countries are ranked lower. Relating to “happiness from a calm society,” the measurements and ranks of Pakistan have significantly increased. The former Soviet Union countries had low measurements and ranks in both the 1990s and 2000s. With regard to "motivation to political activities", Egypt fell sharply in both measurements and ranks, and Eastern European countries including the former Soviet Union countries also declined.

By comparing the 1990s and the 2000s, the results of measurements show that each factor of national character change with the times. This finds that the measurements of national character used in previous studies may not always adequately represent the current situation in each country. This research will provide new measurement values for international comparative research considering national character, and will contribute to obtaining more accurate analysis results. On the other hand, this study does not consider the causes of changes in the components of national character. The causes of changes in each component are thought to be related to the economic and social environment of each country, so further study is necessary.

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Notes

[i]) See, for example, Guan et al. (2005); Kwok & Tadesse (2006); Nabar & Boonlert-U-Thai (2007); Han et al. (2010); Hashim (2012); McGuire et al. (2012); Riahi & Omri (2013); Gray et al. (2013); Gray et al. (2015); Ugrin et al. (2017); Góis et al. (2018); Gupta et al. (2018).

[ii]) With respect to Yugoslavia, there has been no subsidiaries of IBM Corporation since World War II, thus the survey result is based on the research by IBM's consulting company in Yugoslavia.

[iii]) CVS is a survey of students in 23 countries. The measurement of "long-term versus short-term orientation" uses data from 18 of the 23 countries surveyed by CVS that were included in Hofstede (1980).

[iv]) The EMMS survey covered 15 European countries. The measurement of "long-term and short-term orientation" uses data from 11 of the 15 countries surveyed by the EMMS that were not covered by the CVS but were included in Hofstede (1980).

[v]) The 78 countries include the East and West regions of Africa, the French-speaking divisions of Canada, the French-speaking and German-speaking divisions of Belgium and Switzerland, and the East German district.

[vi]) The 96 countries include the East and West regions of Africa, as well as the East German district.
[vii]) These cultural dimensions are measured by dividing the questions into Society and Organization, as well as into Practices and Values, respectively.
[viii]) The Cabinet Office National Life Bureau publishes research papers on the development of social capital and economics, society, etc. (Cabinet Office National Life Bureau (2003)).
[ix]) Topics other than religion and national identity include the role of government, social networks, social inequality, family and gender roles, work orientation, the environment, citizenship, leisure and sports, and health and health care. For more information, please refer to the ISSP website (http://www.issp.org/menu-top/home/).
[x]) Germany was unified in 1990, but it was divided into East Germany and West Germany in the survey.
[xi]) Hong Kong was returned to China in 1997, but it was surveyed as an independent country.
[xii]) Factor analysis is also performed by the Principal Factor Analysis.
[xiii]) Promax method is also tried for factor analysis.

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Research on the Training Paths of Youth Digital Literacy Ability in the Digital Age

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Abstract
Against the background of accelerated advancements in China's digital field, talent with high digital literacy has become a key factor in the comprehensive promotion of the Digital China strategy. However, due to the late start of digitalization in China and the "digital divide" among regions, the comprehensive level of digital literacy among Chinese youth is relatively weak. This paper constructs a reasonable digital literacy framework from the three aspects of comprehensively improving basic digital literacy, multiparty collaborative training of digital economy talent at different levels, and cultivating creative thinking, which will provide indicators and directions for citizens' digital literacy education.

Keywords: Digital Literacy, Young Talent, Creative Thinking, Training Path

1. Requirements of the digital age for youth digital literacy

As China enters a critical period of economic development against the digital background, the optimization and upgrading of its industrial structure are gradually accelerating, the influence of high-tech technologies such as big data, cloud computing, and artificial intelligence is increasing, and the demand for jobs with higher technology content and the division of labor are also varying. Digitization seems to have become a necessity for people. Self-driving and vehicle-infrared cooperative travel services are no longer uncommon. Smart railways, smart civil aviation, smart ports, digital tracks, and smart parking lots are all providing solutions for our needs. Life provides convenience, and digital empowerment will lead the next future.

1.1. The new employment situation places new requirements for digital literacy

The rapid development of the digital economy has promoted significant changes in the demand structure for digital talent, which has led to greater requirements for talent training. Digital literacy ability has become a basic ability that everyone should have, especially for the young generation, who, as digital talenters, have never been able to do so. To meet the development needs of the times, aboriginal people in the era need to have greater digital literacy abilities. Moreover, the rapid development of the digital economy has led to greater requirements for the digital skills and literacy of workers. The requirements for basic digital skills and the application of digital tools in

nondigital occupations are gradually increasing. Skill application training has become the consensus of governments around the world (Li & Cheng, 2023).

Currently, with the development of information technology such as big data, cloud computing, and artificial intelligence, the digital society has become the overall trend of the development and changes of modern society. People's production and life are changed by the digital transformation of society, which will also be extensively affected by people's individual behavior and group interaction, such as technology updating, platform building, and resource sharing (Liang & Hu, 2023). From the perspective of the relationship between youth digital literacy and the digital economy, the improvement of youth digital literacy escorts the promotion of high-quality development of the digital economy. This makes youth workers face more severe and new challenges.

However, due to the information gap, the digital literacy of youth from different regions and different classes is quite different, which is unfavorable for the development of countries in the digital age. Unbalanced development among regions makes future employed persons more inclined to flow to economically developed regions. This study conducted a questionnaire survey on youths in Hangzhou and Jiaxing to compare the comprehensive digital literacy and the effect of urban posts on digital literacy among youths in cities with different economic levels. Regarding the degree of emphasis, areas with a higher economic level have greater requirements for digital skills and digital literacy. Due to the dual effects of the pursuit of personal value and the information technology requirements of the workplace, the requirements for youth digital literacy increased sharply.

1.2. Effect of the national digital economy on the digital literacy of youth

In October 2022, in the "Opinions on Strengthening the Building of High-skilled Talents in the New Era" issued by the General Office of the State Council, it was proposed that the action to enhance the digital literacy and skills of the whole nation should be implemented around the building of cyber power and digital China. At present, China's demand for digital talent far exceeds its supply, and the imbalance between the supply and demand of digital talent has become an important factor constraining the high-quality development of China's digital economy.

The digital literacy ability of youth is directly related to national innovation ability and competitiveness. With today's globalization, competition among countries is no longer simple economic competition but rather comprehensive competition reflected in the fields of science and technology, culture, and education. Therefore, improving the digital literacy ability of youth not only helps their personal growth and development but also helps enhance the overall competitiveness of the country. However, due to the late start of digitalization in China compared with that in Western developed countries, the number of young talented people with high digital literacy is insufficient, and the overall digital literacy of its citizens is not high. This makes it urgent for China to establish a sound scientific and technological talent training system to accelerate the training and development of high-level scientific and technological talent (Liu et al., 2024).

In the digital age, young people are faced with complicated information, especially with the emergence of "digital anxiety" and "digital cocoon rooms." These people are prone to relying on data, which affects their discrimination ability and leads to hidden concerns about growing up under the dominance of data (Wu & Liu, 2023). High digital literacy can enable young people to discriminate and analyze information in digital torrents and understand the useful information they want. In addition, as an important part of society, young people should enhance their digital literacy, which not only promotes the transformation of young people from digital natives to qualified digital citizens with digital awareness, knowledge, skills and ethics but also provides important support for the cultivation of newcomers and contributes to society. The transformation of the public's identity in the digital society also has important reference significance (Wu & Liu, 2023). However, at present, young people have a low sense of digital identity, weak awareness of digital security, their mastery of digital technology is only at the operational level, and high digital literacy talent with digital creativity capabilities is scarce, which cannot drive the improvement of overall civic literacy. How to improve digital cognition ability, enhance digital security awareness, and cultivate creative thinking are the main directions of this paper's study on youth digital literacy training paths.

2. Analysis of digital literacy status among youth

To explore the training path of digital literacy for young people, this paper analyses three current problems: the interregional "digital divide," the lack of digital identity, and the lack of creative digital talent.

2.1. Youths in the digital age lack a sense of digital identity

The rapid development of digital technology has made the importance of digital literacy increasingly obvious, and digital literacy and skills need to be improved. In 1994, Y. Eshet-Alkalai was the first to propose the concept of "digital literacy" (Ling, 2020). In 1997, Gilster proposed a relatively complete definition of digital literacy, that is, "the ability to understand and read the true meaning of various digital resources and information displayed on the computer," which is referred to as literacy in the digital age (Gilster, 1997). In August 2017, the IFLA Declaration on Digital Literacy, the first international systematic declaration on digital literacy, clarified that digital literacy is "the ability to use digital tools and realize their potential." According to UNESCO, digital literacy covers previous information literacy, computer literacy, ICT literacy and media literacy and is defined as "the ability to safely and appropriately acquire, manage, understand, integrate, communicate, evaluate and create information through digital technology." The Central Cyberspace Affairs Commission defines "digital literacy" as a series of qualities and abilities that citizens in the digital society should possess in their studies, work and life, including digital awareness, computational thinking, digital learning and innovation, and digital social responsibility (NetComm China, 2022). Specifically, digital literacy includes digital awareness, computational thinking, digital learning and innovation, and digital social responsibility. Its basic connotation also determines that it is an indispensable part of general-purpose talent with digital technology and literacy; in particular, the awareness of digital social responsibility, with extremely developed digital networks, is the basic literacy of every digital network user. Therefore, in this paper, we propose the necessity of "establishing a sense of digital identity."

New developments have brought about new employment situations. From the perspective of industries, China has successively issued the "Regulations of the State Council on Printing and Distributing Broadband Services" in the fields of information and communication technology, digital manufacturing, the digital service industry, digital agriculture, and digital government. The "Notice of the State Council on Issuing the Action Outline for Promoting the Development of Big Data," "Guiding Opinions of the State Council on Deepening the Integrated Development of the Manufacturing Industry and the internet," "The Development Plan for Smart Manufacturing (2016-2020)", "The State Council A series of guiding documents with a leading role, such as the Guiding Opinions on Deepening the "Internet + Advanced Manufacturing" and the Development of the Industrial internet, and the "Guiding Opinions of the General Office of the State Council on Promoting the Standardized and Healthy Development of the Platform Economy," have a profound impact on the integrated innovation development of various industries and the development of data. (Source: China Academy of Information and Communications Technology.) In addition, a large number of scholars have conducted research on the relationship between technological progress and employment. In the mid-to-late 18th century, scholars began to study the impact of technological progress on employment. Under the dual effects of "innovation" and "substitution," the impact of technological progress on employment is controversial. Berman (1998), Piva (2005) and Smolny (2002) have proven that technological progress can promote employment growth; Caballero and Hammour (1996) and Baltagi and Rich (2005) believe that technological progress will inhibit employment. Some scholars have also studied the impact of technological progress on employment, such as Bratti and Matteucci (2005) and Hornstein et al. (2005), who believe that skill-biased technological progress has reduced the demand for low-skilled labor and increased the demand for high-skilled labor, thus affecting the income level. According to domestic research, Li (2022) believes that the development of the digital economy has created jobs, which has promoted the reproduction of enterprises, and that the new business forms and new models derived from it can alleviate the decrease in employment in the traditional economy. Qi Yudong (2020) and Liao Dongsheng and Sui Haifang (2023) noted that the opportunity to improve the employment environment, enhance employability and improve the quality of employment is the development of digital employment. Economy (Wang, 2023). Under the influence of the above two factors, general-purpose talents with digital skills and literacy have emerged as the times require.

2.2. "Digital divide" between regions and between urban and rural areas

The report of the Nineteenth National Congress pointed out that as socialism with Chinese characteristics has entered a new era, the principal contradiction in Chinese society has transformed into a contradiction between the people's growing need for a better life and unbalanced and insufficient development. With the rapid digital development of first-tier and second-tier cities, the unbalanced development between urban and rural areas and between regions has become increasingly evident.

Among the five aspects of digital literacy, mobile skills are the most basic requirement and prerequisite for training. However, in rural areas and some backward and remote areas, the penetration rate of mobile devices is not high. As of June 2022, the internet penetration rate in rural areas has increased by 1.2 percentage points compared to December 2021; the internet penetration rate in China's urban areas is 82.9%, and the number of internet users is 758 million, accounting for 72.1% of the total number of internet users; the internet penetration rate in rural areas is 72.1%; and 58.8% of the total number of internet users were 293 million, accounting for 27.9% of the total number of internet users. Both the proportion and the number of internet users were less than half of the urban levels. Research shows that at present, the construction of 5G base stations in rural areas seriously lags behind that in cities; there are 572 counties with less than 50% of the household broadband subscription rate, accounting for 21.7% (Ministry of Agriculture and Rural Development Information Centre, 2022). The lack of hardware support for the integrated application of digital technology is an important reflection of weak rural digital infrastructure construction (Li & Xu, 2022). As of June 2022, the number of non-Internet users in China was 362 million. Among them, non-Internet users in rural areas accounted for 41.2%, which was 5.9 percentage points greater than the proportion of the national rural population (He & Liu, 2023). The high number of non-Internet users makes it urgent to build basic technology facilities in rural areas.

Not only in China but also "how to bridge the digital divide" has become an issue of concern worldwide. In Europe, the DigComp framework has always been regarded as a powerful measure for enhancing the digital capabilities and digital literacy of citizens and bridging the digital divide. Gao's team believes that the COVID-19 epidemic and its suppression measures have accelerated digital transformation in European society, and teleworking and distance learning have become the new social normal, which has also led to a further exacerbation of the digital skills gap and unemployment among citizens, i.e., a new digital divide. DigComp2.2 is used as the basic support and scientific basis of the decision-making process to help EU countries develop forward-looking strategic planning and systematic solutions to bridge the digital divide and achieve digital transformation by providing a common understanding of the latest digital capabilities (Gao & Qu, 2024). However, due to the large population base and the large gap in network penetration rates among regions, it is too difficult to rely on one digital model to manage the internet. The top priority is to solve the problem of the popularization of rural digital infrastructure and eliminate the regional digital information gap.

2.3. Training of high digital literacy youth talent with creative thinking

With the advancement of the digital intelligence era, all walks of life have begun to cultivate "high numerical intelligence" talent. Zhang Lan's team analyzed the structure of numerical thinking ability in the training of management accounting talent and conducted research on strategic thinking, data integration and application, interpersonal communication, and learning innovation. ability, and efficient behavior ability, and based on the current status of management accounting personnel training, the management accounting talent training model is optimized from the three perspectives of government, society and universities (Zhang et al., 2023). This reveals that in the digital age, informatization is no longer the monopoly of the computer industry. An increasing number of industries have implemented digital reform, and the demand for talent with high digital literacy has been increasing.

Jingjing Chen used college students as the research object to explore the current paths for cultivating innovative digital talent in colleges and universities. She found that the depth and breadth of innovation and entrepreneurship education in schools are insufficient, the curriculum is relatively simple, and the content is basic. Other aspects of

teaching are also lacking. Most of them rely on knowledge lectures and publicity and education, college student innovation and entrepreneurship competitions, computer competitions, national digital media design competitions, or the construction of industrial incubation bases for college students. However, the implementation of this approach often lacks specific methods and countermeasures, and only a few students who have a foundation and skills or who are interested in this area lack universality and extensiveness, fail to meet the expected goals and requirements, and seriously affect the effectiveness of personnel training (Chen, 2022). However, the current research objects are mostly school students, and the proposed paths are mostly college curriculum education, while digital literacy training paths for youth are rarely involved.

3. Development of digital literacy in youth in the digital age

Against the background of the new round of technological revolution, to seize the opportunity to achieve high-quality development of the digital economy, we must innovate; at the same time, to promote the enhancement of industrial competitiveness and improve China's position in the global value chain, we must also cultivate innovative talent. However, the current studies mostly focus on how to penetrate from the marketing and sales end to the upstream industry chain, such as logistics, manufacturing, R&D, and design (Chen & Ma, 2018), and neglect the cultivation of national digital literacy. Therefore, the present study is based on the goal of cultivating high-end digital talent. We also need to comprehensively improve the basic digital literacy of the Chinese people and cultivate the innovative thinking of young people through multifaceted and multifield cooperation. This paper is based on Professor Xiaojing Li's five aspects of youth digital literacy (Li & Hu, 2020) and proposes the following three training paths:

3.1. Comprehensively improving the basic digital literacy of youth

3.1.1. Increasing the penetration rate of mobile devices

Due to the unbalanced and insufficient development in China, although the proportion of "mobile skills" is greater than that in other countries, the gap between the various regions in China is too large. First-tier cities such as Beijing, Shanghai, Guangzhou and Shenzhen are not just about "mobile skills." Compared with those in ordinary second-tier cities, education related to digital content is also more abundant and excellent. Although ordinary second-tier cities are not as good as first-tier cities in terms of "creation skills," their "operation skills" and "mobility skills" are still very good. For some remote towns and mountainous areas, operation and even movement skills are slightly lacking. To comprehensively improve basic literacy, we must first start with simpler "mobility skills" and "operation skills" to reduce interregional digital information differences.

3.1.2. Strengthen security skills education to acquire a sense of digital identity

With the popularization and development of information technology, many developed countries and organizations have actively explored digital literacy education and have gathered various forces from government departments, higher education management and research institutions, and library industry organizations to support the research and development of digital literacy in these countries. Educational practice (Zhang & Huan, 2016). Australia, the United Kingdom, and Singapore have specifically formulated digital skills training goals in their national digital strategies and promoted the implementation of digital literacy education by developing digital skills course training. Among them, while organizing a series of digital literacy practice activities, a number of library associations in the UK have also carried out a large amount of research on digital literacy, including digital literacy education mechanisms, curriculum systems, assessment frameworks, and team and institution building (He, 2022). Western countries have focused on digital literacy education research for a long time and have established relatively complete and mature digital literacy education models that are suitable for their citizens. Their digital literacy education practices have mainly revolved around digital hardware facilities, curriculum systems, cooperation mechanisms, etc. (Li et al., 2023).

Building a two-way connection between digital literacy and youth values can help young people better integrate into the torrent of the digital age. The construction of the value subjectivity of youth enables them to set clear

personal goals and develop self-management and self-discipline abilities to more effectively master digital technology and improve digital literacy (Smahel et al., 2020). When young people develop digital identity awareness in their own values, they can spontaneously learn digital technology and cultivate digital thinking. Thus, young people realize that the digital society is not as far away as it used to be. Under the joint action of subjective and objective factors, social needs and values, young people can assume social responsibility and have more in-depth experience with the positive role of digital technology in social change. This can thereby enhance digital literacy.

3.2. Multiparty collaborative training for digital economy talent at different levels

The development of emerging technologies such as big data, the internet, and artificial intelligence as well as the new characteristics of industrial development in the digital age have placed new requirements and new ideas on the cultivation of social talent, and the demand for compound talent is gradually increasing. Now that information technology talent is no longer exclusive to the computer industry, there is an enormous demand for young talent with high digital literacy in the business field, construction field, or even the education field. Therefore, this study proposes the following points on how to cultivate interdisciplinary or even multidisciplinary digital talent.

3.2.1. Carrying out the globalization of digital information

On the basis of already having a sense of digital identity, a more open online environment is created where young people can communicate with the world and exercise their operational, social and creative abilities in a freer atmosphere. Digital awareness among young people should be increased to avoid deficiencies in digital awareness. In addition, when individuals understand the value of digital resources, understand the significance of digital governance, and expand the breadth and depth of the use of digital technologies, due to their age and education levels, there are differences. A person's vision depends entirely on later education. The reason why first-tier cities far exceed second-tier cities in many aspects of digital literacy lies in the rich cognitive environment provided by international metropolises. Thus, how can people from other cities have experience similar to that of first-tier cities? what about resources? The answer lies on the internet. Youths should pay attention to new strategies, new plans, new industries, new formats, and new models of relevant national ministries and leading enterprises in the digital economy and digital technology to synchronize with the information and language of the digital world and bridge the "digital divide."

3.2.2. Multidomain digital technology learning

The future is one of multifield integration and development. Fang Wang et al. believe that with the deepening of industrial integration and the increasingly complex market environment against the background of the digital economy, most enterprises are facing interdisciplinary problems and require compound talents with interprofessional, interdisciplinary and knowledge integration. The shortage of data is even more scarce, especially when big data is integrated into production and operation as a new production factor, which inevitably requires industrial economy talent to have the ability to process and apply data. Therefore, graduate students in industrial economics should not only have solid professional knowledge but also have relevant peripheral basic scientific knowledge to achieve knowledge integration. Youth improve their digital literacy by understanding the digital technologies involved in different disciplines and fields at work and finding suitable participation methods when faced with hot concepts, such as metaverse, NFT, and numbers. Exercise your comprehensive digital literacy through practice.

3.2.3. Practical cultivation ability

Among the five elements of youth digital literacy, operational ability is indispensable. We must cultivate not only interdisciplinary R&D talent with solid professional knowledge but also digital technology application talent and digital skills talent. The training of digital talent should be oriented toward industrial practice and real business scenarios. Relevant state departments should encourage the deep participation of leading enterprises in the fields of digital industrialization and industrial digitization in the design of professional curriculum systems. Colleges

and universities should further deepen the integration of production and education, establish a collaborative education model between production and education and science and education centering on the industrial practice of the digital economy, and implement the key processes, key links and typical scenarios of digital technology research and development and its integration with businesses into professional teaching links to facilitate teaching and research. Close connection with industrial practice.

3.3. Cultivate creative thinking

In the digital economy era, enterprises need digital transformation, and people also need digital transformation. They must build digital thinking and be good at using data to help themselves. Professor Li Xiaojing's research report on the quality of teenagers in Shanghai shows that, among the five dimensions, mobile skills (M=4.49) are the highest, which is different from the conclusion that foreign countries have greater operational skills and social skills. However, creative skills (M=2.90) were the lowest, which was consistent with the findings of a previous study (Deng et al., 2023). This means that although creative skills are listed in the curriculum standards, the actual teaching effect is not satisfactory compared to other dimensions. The mastery and teaching of mobile skills are still difficult in information technology education, and they are also key to determining whether Chinese school-age children can gain advantages in global information age competition (Ying, 2021). Therefore, how should we change? The main method is to abandon the traditional "silent" classroom and create a free environment to stimulate creative thinking.

Comparing the development of the digital economy between China and the rest of the world, it is not difficult to find that the originators of Bitcoin, whether it was Bitcoin in 2002 or the hottest metaverse economy at present, are often foreigners. Don't we think this way? However, throughout the history of economics, many excellent theories have been proposed by the Chinese. Then, why can we only "process" but not "invent"? This paper proposes that the reason lies in the curriculum atmosphere of institutions of higher learning.

An open and inclusive classroom allows different perspectives, and everyone has their own unique thoughts. The world is full of diverse thoughts and viewpoints, and what we have to do is to listen to the thoughts of others and show respect for them. In an open and inclusive classroom, students are allowed to make mistakes, and sharp views are allowed. In this classroom atmosphere, teachers respect the subjectivity of students and stimulate students to engage in creative thinking and critical thinking (Ying, 2021). The shaping of thinking is a long-term process, especially the cultivation of creative critical thinking, which must provide a free platform and sufficient time for independent thinking. "The cultivation of thinking is inseparable from communication." However, because most of China's innovative talent is the product of colleges and universities, traditional education in China emphasizes knowledge teaching and lacks innovation vitality, and there is a lack of communication between teachers and students as well as between students. Thinking collisions make it difficult to form innovative thinking. To improve quick thinking and efficiency in the classroom, the "silent" atmosphere in the university classroom must first be broken, speeches are encouraged, and students are free to express their views.

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Organizational Culture, Transformational Leadership, and Work Motivation's Effect on ABA Kindergarten Teachers' Performance and OCB

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Abstract
The goal of this research is to prove the impact of organizational culture, transformational leadership, and work motivation on the work performance and OCB of ABA Kindergarten teachers and employees in Yogyakarta. This study employs a quantitative research methodology. Data was collected from 207 respondents in 56 ABA kindergartens in Yogyakarta. A questionnaire survey was created using Google Forms to collect data on a Likert scale of 1–7 and analyzed using SPSS. Empirical research findings show that more than 60% of respondents chose an 'agree' scale on the questionnaire items. Reinforcing the findings, organizational culture, transformational leadership, and work motivation proved to have a positive impact on performance and OCB. This study looks at a wider range of variables than earlier ones did, so the information it gives is more complete and useful. Respondents who fill out the survey and a bigger range of scales make the research more objective and representative. This study helps teachers and staff manage schools better. Human resources manages work performance and OCB. This study may promote public sector progress generally.

Keywords: Organizational Culture, Transformational Leadership, Work Motivation, ABA Kindergarten, Performance, OCB

1. Introduction

1.1 Background of The Problem

There is a growing expectation for public servants to work harder (Potipiroon & Faerman, 2020). The event revealed various human resource restrictions that hindered staff performance (Notanubun, 2021). Employee

performance and organizational civic behavior are crucial components of human resources in the public sector (Hermanto & Srimulyani, 2022). Podsakoff et al. (2000) found that Dennis Organ and colleagues coined the term OCB in 1983. Chester Barnard in 1938 suggested 'staff readiness to contribute,' while Daniel Katz in 1964 suggested 'innovative and spontaneous behavior.' In 1988, the Body defined OCB as employees who go above and beyond to increase company efficiency.

OCB research began in the 1990s, according to De Geus et al. (2020). In the 1990s, scholars from diverse fields began emphasizing OCB for organizational goals, according to Podsakoff et al. (2000). OCB affects well-being and progress; hence, all public systems should practice it, according to Ingrams (2020). Organizational culture, transformational leadership, and work motivation (Jafarpanah & Rezaei, 2020). The problem is that there are only a few indicators used to measure each variable, as well as a lack of thorough variable testing integration. Organizational cultural variables, transformational leadership, and work motivation have yet to be studied together on work performance variables, or OCBs.

1.2 Theoretical Framework

Chang et al. (2021) and Krajcsák & Kozák (2022) found that good organizations can influence OCB. Jeong et al. (2019) studied organizational culture and its effects on OCB. They examine four dimensions of organizational culture: clan, adhocracy, hierarchy, and market. It demonstrates that all dimensions, except hierarchical culture, have an impact on OCB. Under a hierarchical culture, employees prioritize their work and report to their superiors, which discourages them from engaging in other social activities. Sarfraz et al. (2022) add that a hierarchical culture makes it difficult for managers to determine if employees are working too hard or not doing enough to help each other at work.

Potipiroon & Faerman (2020) also conducted a comprehensive analysis of OCB research. Even though previous research focused on positive OCB aspects, the author found that OCB can harm employee well-being. OCB tasks, such as additional hours, may cause emotional strain, whereas regulator work may not. However, research on OCB's emotional impact is still ongoing. OCB has the potential to dominate a company and create internal tension (Li & Xie, 2022). It is based on Morrison & Phelps' (1999) research and Bettencourt's (2004) research. Researchers found "change-oriented" OCB, which emphasizes employees' active participation in organizational transformation.

Khan et al. (2020) found that two decades ago, a small academic community believed there was a clear and significant correlation between OCB and leadership. In recent years, many academies have begun to study the transformative impact of leadership on OCB, resulting in good and substantial results. Alsheikh & Sobihah (2019) found that job satisfaction has had a positive and significant impact on OCB since 1990. Zia et al. (2022) examined school management in the education sector with OCB teachers. They found that school management creates a conducive learning environment and shows teacher appreciation, which benefits OCB.

This research on work and OCB differs from previous studies. This study examines public sector resource management and OCB, with a focus on TK-level education. Additionally, this study used a total of nine Likert scales, up from five. According to Jeong et al. (2019), Kuesioner estimates range from 'strongly disagree' to 'strongly agree.' This research also examines organizational culture, transformational leadership, and employee motivation, as well as their effects on productivity and OCB. Compared to previous research, this study is more comprehensive and varied in its factors and indicators, providing broad and integrated information in the public sector, especially education. This study has the potential to improve society and the nation (Mello, 2019).

According to Notanubun (2021), leadership and culture affect organizational performance. Thus, understanding organizational culture, transformational leadership, and employee motivation in relation to work performance and OCB is critical in both theoretical and practical contexts. The correlation between work and OCB is still relevant to research. De Geus et al. (2020) say public-sector OCB research is scarce. OCB is important for organizational success because knowledge and experience distribution are not successful in many public sector organizations.

Therefore, we must continue this research to gain a comprehensive understanding of human resource management issues.

1.3 Hypothesis-Research Design Relationship

The study examines how organizational culture, transformational leadership, and work motivation affect performance and OCB. Researchers call it a "free variable" because it can affect bound variables indefinitely. Variables have different dimensions and indicators.

Performance (P) helps a business improve its services and products, giving it a competitive edge (Budur & Demir, 2022). Performance involves doing activities accurately, efficiently, and without wasting time (Notanubun, 2021), maximizing task intensity and workload (Lopez-Martin & Topa, 2019). Habeeb (2019) confirmed that performance affects work devotion, notably job retention. A rise in performance makes an organization successful, according to Arshad et al. (2021). Al-Swidi et al. (2021) found a considerable positive association between organizational culture and performance. Leadership affects an organization's performance the most, according to Notanubun (2021). Strong job commitment reduces employee turnover (Li & Xie, 2022) and encourages active participation in organizational advancement due to a sense of obligation to stay (Grego-Planer, 2019; Hendry et al., 2019; Zayed et al., 2022; Hamid & Dinianti, 2023).

Organizational citizenship behavior (OCB) is employee behavior that benefits all organizational activities (Yuwono et al., 2023). The OCB defines discretionary conduct as voluntary overtime labor without pressure (Sarfraz et al., 2022), taking extra hours, attending workplace activities, and advising on organizational development (Khan et al., 2020). Potipiroon & Faerman (2020) noted that OCB requires people to take initiative voluntarily and without expecting a reward from the organization. Voluntary involvement and cooperative connections with coworkers measure positive employee conduct. It needs problem-solving, social awareness, willingness to help, and fairness and honesty with coworkers. That literature includes works by Alsheikh & Sobihah (2019); Bartlett et al. (2022); Hermanto & Srimulyani (2022); Sarfraz et al. (2022). Organizational success comes from employee involvement in OCB, which includes voluntary activity, personal discretion, and supporting coworkers outside of work hours without complaining (Kim et al., 2020; Marcos et al., 2020; Arshad et al., 2021; Notanubun, 2021). This practice promotes positive engagement without expectations (Osman et al., 2019; Potipiroon & Faerman, 2020). OCBs will impact future organizational efficiency and profitability (Massoudi et al., 2020). Yuwono et al. (2023) found that this benefits all organizational activities. However, poor organizational culture lowers job satisfaction and OCB rates (Endrejat, 2021; Habeeb, 2019).

Organizational culture (OC) includes spiritual ideals, family values, and respect for superiors (Sani & Ekowati, 2019; Solís & Brenes Leiva, 2019; Rathee & Rajain, 2020; Rocha & Pinheiro, 2021). We can examine organizational behavior by analyzing adaptation, innovation, creativity, flexibility, goal achievement, and output orientation (Jeong et al., 2019; Hamzah et al., 2020; Balluerka et al., 2021; Gorostiaga et al., 2022). Research has demonstrated that a positive organizational culture enhances work satisfaction in OCBs. High-demand workplaces that adopt a flexible culture and promote OCB make improvements (Men & Yue, 2019; Hooi et al., 2022). Official standards help promote faith and family, which influences the OCB (Jafarpanah & Rezaei, 2020). Several factors affect excellent performance. Freedom and the ability to voice a belief in public are crucial factors. According to Sani & Ekowati (2019); Rathee & Rajain (2020); Rocha & Pinheiro (2021), these factors are crucial. It is crucial to communicate and maintain transparency about organizational culture values and norms (Sarfraz et al., 2022; Jeong et al., 2019). Performance also requires a goal and a focus on outcomes (Lopez-Martin & Topa, 2019).

Transformational leadership (TL) has many traits. Effective leadership necessitates a clear vision (Sarfraz et al., 2022), the ability to regulate members' emotions (Bartlett et al., 2022; Sri Ramalu & Janadari, 2022), responsiveness (Men & Yue, 2019), servitude (Li & Xie, 2022), self-awareness of self-limits, collaboration, commitment, and support (Hanh Tran & Choi, 2019), innovation, proactiveness, courage to take risks, and the ability to influence a team (Jeong et al., 2019; Notanubun, 2021; Lee et al., 2022) that outlined these requirements for effective leadership. In education, the head of school administers fair policies, incorporates teachers in decision-making, and develops healthy connections between subordinates and superiors to increase teacher

performance (Hermanto & Srimulyani, 2022). Through common norms (Khan et al., 2020), motivated personnel will professionally and supportively construct organizational culture, encouraging organizational commitment (Yuwono et al., 2023).

Work Motivation (WM) is a psychological component that motivates workers to achieve better. Well-being, attachment, happiness (Jafarpanah & Rezaei, 2020; Nurjanah et al., 2020; Bartlett et al., 2022), facilities and infrastructure (Notanubun, 2021; Zia et al., 2022), feelings of appreciation, organization, superior care, work-life balance, and supervision all have an impact on WM (Osman et al., 2019; Abdullah & Marican, 2020; Arshad et al., 2021; Abdullah & Wider, 2022). Workplace motivation boosts OCB and confidence in overcoming challenges (Abdullah & Marican, 2020). Efficiency, honesty, commitment, and independence in essential activities can measure work motivation (Alanazi, 2021; Habeeb, 2019; Jeong et al., 2019) which have all conducted studies on this topic. Workers' performance will improve as a reward for better quality of life, means and supplies, health, satisfaction, recognition, and appreciation (Lopez-Martin & Topa, 2019; Balluerka et al., 2021; Zia et al., 2022).
Government-owned businesses make up the public sector. This sector comprises schools, hospitals, and other public facilities. The public sector's main goal is to offer critical services to society. Public-sector organizations are using collaborative innovation to solve challenging problems and boost productivity (Baa & Chattoraj, 2022). OCBs commonly form in the public sector due to a lack of qualified people, prompting them to volunteer their time and efforts to better the organization (Yuwono et al., 2023). Public sector managers must be innovative, risk-taking, and able to encourage subordinates to seize chances (Lee et al., 2022). To boost teacher effectiveness, the head of school creates policies that include equitable remuneration, teacher involvement in decision-making, and harmonious subordinate-superior relationships (Hermanto & Srimulyani, 2022). This policy establishes general rules to promote a professional and successful organizational culture that fosters commitment (Khan et al., 2020; Yuwono et al., 2023).

The study examines Yogyakarta's Aisyiyah Bustanul Athfal Children's Park (ABA). Indonesia's earliest and oldest early childhood education institution is ABA, under Aisyiyah, the Muhammadiyah women's group. Siti Walidah (Nyai Ahmad Dahlan) founded the ABA. He founded 'Aisyiyah, Muhammadiyah's first independent organization, to start his humanitarian and intellectual career. Yogyakarta-pioneered ABA clinics have spread nationwide.
This study proposes a hypothesis about the influence of organizational culture, transformational leadership, and motivation for work on work performance and OCB. **Figure 1** explains the variable hypotheses presented below.

Description:

- H1a: Organizational culture has a significant positive effect on performance.
- H1b: Organizational culture has a significant positive effect on OCB.
- H2a: Transformational leadership has a significant positive effect on performance.
- H2b: Transformational leadership has a significant positive effect on OCB.
- H3a: Work motivation has a significant positive effect on performance.
- H3b: Work motivation has a significant positive effect on OCB.

This study aims to validate the proposed hypothesis. **Figure 1** shows six relationships between independent and dependent variables. Each conceptually supports the developed framework, as demonstrated by this research.

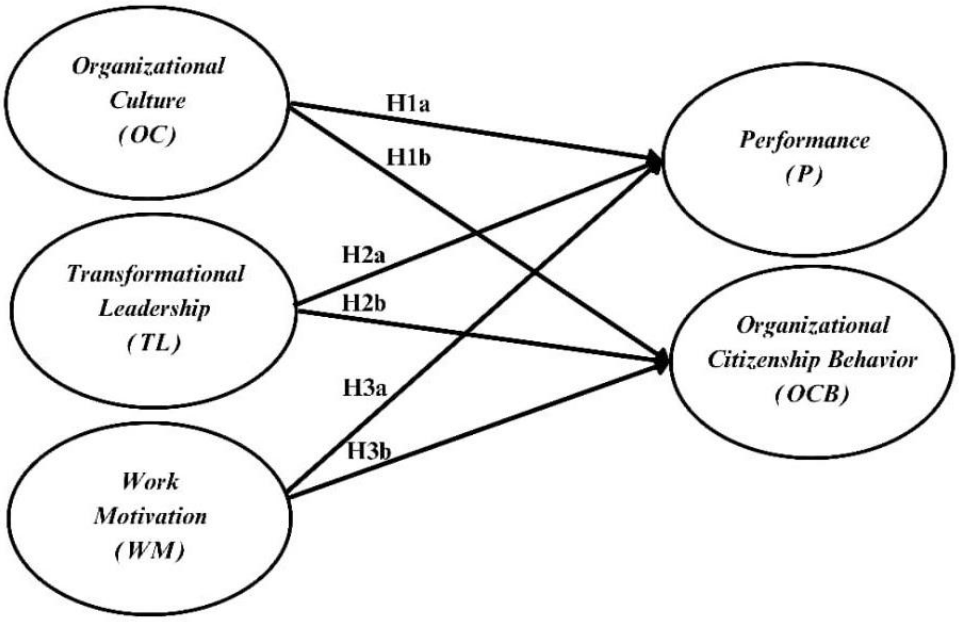

Figure 1: Model hypothesis of the effect of organizational culture, transformational leadership, and work motivation on performance and OCB

2. Method

2.1 Objects and Research Subjects

The research object is the variable under investigation. Research concerns a variable geographical spread. Subjects are entities or topics that can provide important data for research studies. Subjects, or entities studied, are called research objects. Before collecting data, a researcher must define his research goals. Researchers need specific sampling procedures to find and recruit subjects. The respondent's consent was validated by calling and presenting research documentation. Next, the data is collected in the desired manner. This study chose high school-educated teachers and employees as respondents. Selecting appropriate respondents and study objects enhances research efficiency.

2.2 Sample Sizes and Population Sampling Methods

The study results are based on a sample of the research population. Rawung (2020) accurately selects and obtains population samples. Characterizing a population, developing a sample framework, determining a sampling procedure, identifying a good sample size, and selecting samples are all part of this process. The sample selection methodology is a method for selecting and collecting population samples. Evaluation and public understanding are used to choose samples for the investigation. This method guarantees population representation in the sample. Research needs to determine the sample size. Teacher samples with a minimum high school education were collected for this investigation. This sample was taken from 56 of 72 Yogyakarta City ABA TK units (KEMDIKBUD & IGTKI-PGRI, 2023).

2.3 Data Types and Data Collection Techniques

Types and techniques of data collection This study uses quantitative, primary, and cross-sectional data. Rawung (2020) describes quantitative data as numerical. Researchers or organizations directly acquire primary data from research subjects. Cross-sectional data can also represent a unique time point. Descriptive research seeks to accurately and thoroughly describe people, events, and conditions, according to Siedlecki (2020) and Sulistyawati & Trinuryono (2022). Researchers use it to study a population, discover problems, or compare traits and habits. This method draws inferences from numerical data. A quantitative survey utilizing a questionnaire is used to collect data. Many human resource management studies use survey and experimental design, according to De Geus

et al. (2020). Most public-sector OCB research involves quantitative methods and surveys. According to Rawung (2020), researchers conduct surveys on a specific population to observe a specific unit in a region. Massoudi et al. (2020) confirmed that personnel completed a questionnaire.

Google Forms was used to create a Likert-scale questionnaire with seven assessment ranges. According to Jeong et al. (2019), questionnaires use a "very disagree" to "very agree" scale. Gazzola et al. (2020) said Google Forms is a free tool for creating and tracking questionnaires. The surveys protect respondents' identities, as well as findings on how corporate culture, transformational leadership, and work motivation affect work performance and OCB. Then, the head of school encourages respondents to complete Google Forms to analyze variable indicators. The five blocks of indicators cover job performance, OCB, organizational culture, transformational leadership, and work motivation.

2.4 Operational Research Variable Definition

Operational definitions in quantitative research identify a variable's relevance in determining how to measure, classify, or regulate it. Independent (free) and dependent (binding) variables make up the selected variable. The free variable drives tied variable change. Organizational culture, transformational leadership, and work motivation are investigated as independent variables, while bound variables are influenced by free variables.

2.5 Instrument Quality Test

Validity and reliability testing are used to assess instrument quality. Alsheikh & Sobihah (2019) devised a survey questionnaire for data gathering. The researchers carefully design questionnaire items to avoid redundancy, as they use dimensions to evaluate research model constructs. The researchers selected questionnaire items based on conceptual findings and explanations in the study literature. These products were later altered to suit research purposes. **Table 1** shows that questionnaire-closed statements scored 1–7 from "strongly agree" to "strongly disagree" based on their level of agreement.

Table 1: Likert Scale Seven Scores

Scale	**Initial**	**Score**
Strongly Disagree	SD	1
Disagree	D	2
Partially Disagree	PD	3
Neutral	N	4
Partially Agree	PA	5
Agree	A	6
Strongly Agree	SA	7

Reliability tests measure instrument confidence. A consistent test result indicates good instrument confidence. Instrument reliability tests directly affect the veracity of the results. The researchers used Cronbach's alpha to assess the questionnaire's statements' relationships and the measurement devices' consistency and reliability. This study used SPSS for validity and reliability tests. The correlation and bivariate analysis tests SSPS validity and significance (P-value). Scale analysis, based on Cronbach's alpha, checks reliability. The validity or reliability of questionnaire data is dependent on P-values less than 0.05 and Cronbach's alpha values greater than 0.70. SPSS creates circular graphs of valid, reliable, and normal data.

2.6 Research Stage

This study uses Google Forms for a questionnaire. Google Forms can show multimedia questions and share survey results on digital networks. According to Ismail & AlBahri (2019), the early stages of research identify issues and potential solutions, define the subject, and formulate solutions. Researchers use design and development to continue the implementation process. In the final phase, researchers evaluate, disseminate, draw logical conclusions, and suggest related study ideas. The study project lasts from July 2023 to March 2024.

3. Results

3.1 The Validity, Reliability, and Normality Tests

A P-value of 0.05 or less indicates data validity for the questionnaire item. According to **Table 2**, all items in each variable have significance values below 0.05. The research shows that the questionnaire is valid.

Table 2: Validity Test Results

Variable		**Dimension**	**P-Value**
X1	Organizational Culture (OC)	Spirituality culture, clan culture, hierarchy culture, adhocracy culture, market culture	<0,001
X2	Transformational Leadership (TL)	Visionary, humanistic, emotional intelligence, inspirational, intellectual stimulation	<0,001
X3	Work Motivation (WM)	Rewards, satisfaction, challenges, facilities, support	<0,001
Y1	Performance (P)	Quality, quantity, accuracy, flexibility, commitment	<0,001
Y2	Organizational Citizenship Behavior (OCB)	Altruism, conscientiousness, civic virtue, courtesy, sportsmanships	<0,001

Source: Primary data processed in 2024

The reliability test evaluates the researchers' questionnaire data's consistency and dependability. After the questionnaire items have been validated, this test is concluded. If empirical data determines a reliability test, it is high-quality. This dependency test employs scale analysis. Reliability testing is conducted using Cronbach's alpha. A variable is considered reliable if its alpha exceeds 0.70. **Table 3** shows that Cronbah's alpha for the questionnaire variable exceeded 0.70. Thus, researchers can conclude that questionnaire item connections are reliable.

Table 3: Reliability Test Results

Reliability Statistics	
Cronbach's Alpha	Item Number
0,93	59
Source: Primary data processed in 2024	

Statistical tests, termed normalcy tests, examine whether data follows the normal distribution or deviates from it. This study evaluated normalization with 207 elements using the QQ visual plot approach, which represents the full variable. Testing follows the sequential procedures outlined by SPSS: **Table 4** presents a Descriptive Statistics QQ Plot in SPSS.

Table 4: Description Model QQ Plot Total Variable

Model Description

Model Name		MOD_2
Series or Sequence	1	TOT_VAR
Transformation		None
Non-Seasonal Differencing		0
Seasonal Differencing		0
Length of Seasonal Period		No periodicity
Standardization		Not applied
Distribution	Type	Normal
	Location	estimated
	Scale	estimated
Fractional Rank Estimation Method		Blom's
Rank Assigned to Ties		Mean rank of tied values

Applying the model specifications from MOD_2

The QQ plot diagonal line shows the normal distribution-expected data pattern. The dots along the line represent the current tested data condition, which is the spread of X and Y total values. If most dots are adjacent or connected by a line, it indicates a normal distribution. At least one point outside the QQ plot line shows a data value that does not match the normal distraction. According to **Figure 2** and the explanation, the questionnaire variables have normal distributions. Most of the graphic shows QQ parallel to the diagonal.

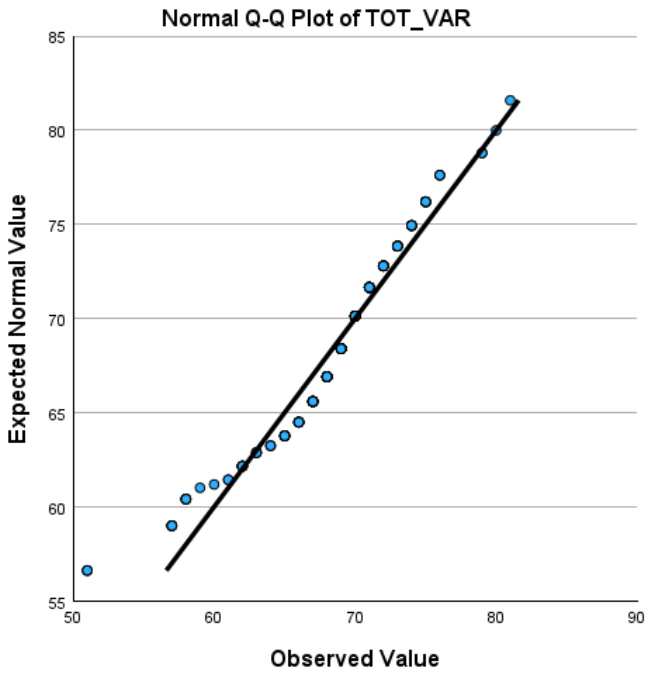

Figure 2: Normality Test QQ Plot Total Variable

3.2 Factor Analysis

Confirmatory factor analysis (CFA) is a multivariate analysis based on the relationship or correlation between variables and the consistency of indicators in variables. SPSS Analyze > Dimension Reduction > Factor Steps Arshad et al. (2021) said that the CFA supplied a matching model, whereas the correlation matrix gave the significant influence of the variable X against the Y variable. The Kaiser-Meyer-Oikin (KMO) test results in **Table 5** show a value > 0.50, so all indicators can be analyzed further. For the result, Barlett's Test of Sphericity showed

a significance of <0,001, so the variable is considered significant and correlated. Then, the testing continued with the Measure of Sampling Adequacy (MSA).

Table 5: Output Factor Analysis with the KMO Test and Bartlett's

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.887
Bartlett's Test of Sphericity	Approx. Chi-Square	2319.989
	df	300
	Sig.	<,001

Table 6 displays the factor analysis Anti-image Correlation value. MSA requirements are met with an Anti-image Correlation score above 0.5. All indicators studied correspond to their variables if so.

Table 6: Factor Analysis Output with Anti-Image Correlation

Variable	Indicator	Value
Organizational Culture (OC)	X1_1 (spirituality culture)	0,82[a]
	X1_2 (clan culture)	0,86[a]
	X1_3 (hierarchy culture)	0,91[a]
	X1_4 (adhocracy culture)	0,90[a]
	X1_5 (market culture)	0,87[a]
Transformational Leadership (TL)	X2_1 (visionary)	0,93[a]
	X2_2 (humanistic)	0,93[a]
	X2_3 (emotional intelligence)	0,89[a]
	X2_4 (inspirational)	0,89[a]
	X2_5 (intellectual stimulation)	0,90[a]
Work Motivation (WM)	X3_1 (reward)	0,94[a]
	X3_2 (satisfaction)	0,87[a]
	X3_3 (challenges)	0,91[a]
	X3_4 (facilities)	0,90[a]
	X3_5 (support)	0,93[a]
Performance (P)	Y1_1 (quality)	0,81[a]
	Y1_2 (quantity)	0,81[a]
	Y1_3 (accuracy)	0,78[a]
	Y1_4 (flexibility)	0,82[a]
	Y1_5 (commitment)	0,83[a]
Organizational Citizenship Behavior (OCB)	Y2_1 (altruism)	0,88[a]
	Y2_2 (conscientiousness)	0,90[a]
	Y2_3 (civic virtue)	0,91[a]
	Y2_4 (courtesy)	0,79[a]
	Y2_5 (sportsmanships)	0,89[a]

The extraction value on the communalities value shows how much the variable researched influences the component created. A variable influences the created factor when it satisfies the minimum test conditions. Extraction values above 0.5 meet the communalities criteria. Most of the 25 indicators have extraction values above 0.5, while a small portion is near 0.5. These findings reveal that most indicators strongly correlate with

variables. **Table 7** shows that the X3_1 (reward) indicator of 0.94 may describe the 94% "reward" factor. Communalities with higher indicator values indicate a stronger association with the forming factor. All variable indicators contribute to the generation of the factor.

Table 7: Factor Analysis with Communalities Test

Communalities

	Initial	Extraction
X1_1	1.000	.552
X1_2	1.000	.690
X1_3	1.000	.476
X1_4	1.000	.630
X1_5	1.000	.709
X2_1	1.000	.741
X2_2	1.000	.579
X2_3	1.000	.742
X2_4	1.000	.820
X2_5	1.000	.774
X3_1	1.000	.641
X3_2	1.000	.600
X3_3	1.000	.604
X3_4	1.000	.618
X3_5	1.000	.661
Y1_1	1.000	.648
Y1_2	1.000	.641
Y1_3	1.000	.675
Y1_4	1.000	.403
Y1_5	1.000	.612
Y2_1	1.000	.686
Y2_2	1.000	.552
Y2_3	1.000	.450
Y2_4	1.000	.667
Y2_5	1.000	.592

Extraction Method: Principal Component Analysis.

After analyzing these aspects, this study's indications match their variables. The indicators are strongly supportive of each other. These indicators show the significance and association of independent and dependent variables. Thus, these research variables must be discussed more to demonstrate their impact.

4. Discussion

4.1 The Effect of Organizational Culture on Performance

Table 8 reveals that over 60% of respondents supported questionnaire statement questions on organizational culture and work performance (**Figure 3**). Previous research has shown that organizational culture improves work performance, supporting our findings (Al-Swidi et al., 2021). This is because cultural values reflect employees' ideas and motivate them to work well (Habeeb, 2019; Jeong et al., 2019). A strong company culture boosts confidence, encourages risk-taking, and boosts performance (Yuwono et al., 2023). This study proves the H1a hypothesis that organizational culture has a significant positive effect on performance.

Table 8: Mean Variable Score of Organizational Culture (OC) and Performance (P)

OC			**P**		
Scale	**Frequency**	**Percent (%)**	**Scale**	**Frequency**	**Percent (%)**
SD	0	0,00	SD	1	0,48
D	3	1,45	D	7	3,38
PD	3	1,45	PD	3	1,45
N	12	5,80	N	15	7,25
PA	7	3,38	PA	16	7,73
A	**134**	**64,73**	**A**	**128**	**61,84**
SA	48	23,19	SA	37	17,87
Total	**207**	**100,00**	**Total**	**207**	**100,00**

Note: SD (Strongly Disagree), D (Disagree), PD (Partially Disagree),
N (Neutral), PA (Partially Agree), A (Agree), SA (Strongly Agree)

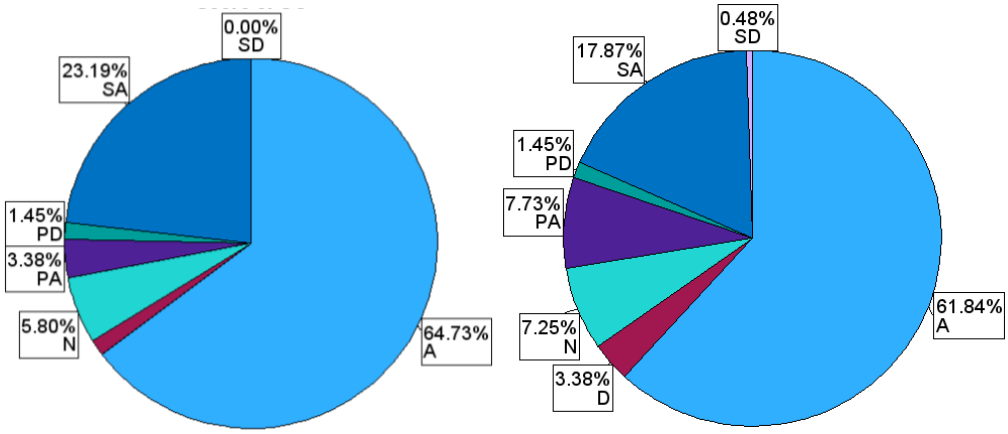

Figure 3: Left (Organizational Culture Score), Right (Performance Score)

4.2 The Effect of Organizational Culture on OCB

According to **Figure 4**, **Table 9**, over 60% of respondents supported questionnaire statement items on organizational cultural characteristics and organizational citizenship behavior (OCBs). It was found that organizational culture has a positive effect on OCB, which is supported by earlier research (Chang et al., 2021; Hooi et al., 2022; Krajcsák & Kozák, 2022). This is because morality, innovation, and adaptability give employees confidence and let them help their coworkers without feeling like they have to (Abdullah & Marican, 2020; Balluerka et al., 2021). Because cultural values encourage voluntary participation, an ethical organizational culture that promotes open and honest communication can help OCB employees behave well (Hermanto & Srimulyani, 2022; Thelen & Formanchuk, 2022). As a result, researchers confirmed the H1b hypothesis that organizational culture has a significant positive effect on OCB.

Table 9: Mean Variable Score of Organizational Culture (OC) and OCB

OC			**OCB**		
Scale	**Frequency**	**Percent (%)**	**Scale**	**Frequency**	**Percent (%)**
SD	0	0,00	SD	0	0,00
D	3	1,45	D	1	0,48
PD	3	1,45	PD	1	0,48
N	12	5,80	N	11	5,31
PA	7	3,38	PA	9	4,35
A	**134**	**64,73**	**A**	**148**	**71,50**
SA	48	23,19	SA	37	17,87
Total	**207**	**100,00**	**Total**	**207**	**100,00**

Note: SD (Strongly Disagree), D (Disagree), PD (Partially Disagree), N (Neutral), PA (Partially Agree), A (Agree), SA (Strongly Agree)

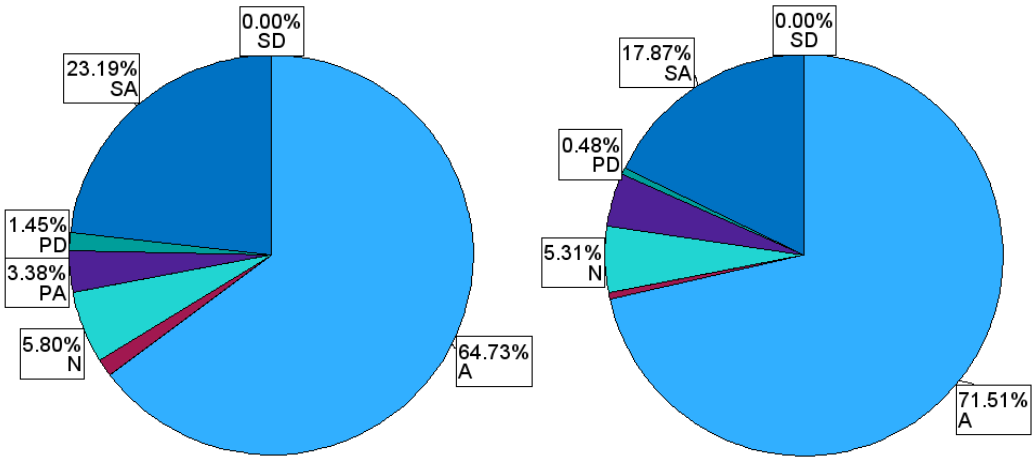

Figure 4: Left (Organizational Culture Score), Right (OCB Score)

4.3 The Effect of Transformational Leadership on Performance

Table 10 demonstrates that over 60% of respondents supported transformational leadership and performance characteristics questionnaire statement items (**Figure 5**). The correlation corroborated earlier evidence suggesting transformative leadership improves work performance. The study was conducted by Jeong et al. (2019); Lopez-Martin & Topa (2019); Khan et al. (2020); Notanubun (2021); Bartlett et al. (2022). A humanistic leader promotes optimism in the workplace and provides innovative solutions (Khan et al., 2020; Lee et al., 2022), because showing appreciation and attention to his employees fosters confidence and value, allowing him to work at his best and produce high-quality jobs (Abdullah & Marican, 2020; Yuwono et al., 2023). Thus, researchers proved the H2a hypothesis that transformational leadership has a significant positive effect on performance.

Table 10: Mean Variable Score of Transformational Leadership (TL) and Performance (P)

TL			**P**		
Scale	**Frequency**	**Percent (%)**	**Scale**	**Frequency**	**Percent (%)**
SD	1	0,48	SD	1	0,48
D	3	1,45	D	7	3,38
PD	3	1,45	PD	3	1,45
N	18	8,70	N	15	7,25
PA	14	6,76	PA	16	7,73
A	**148**	**71,50**	**A**	**128**	**61,84**
SA	20	9,66	SA	37	17,87
Total	**207**	**100,00**	**Total**	**207**	**100,00**

Note: SD (Strongly Disagree), D (Disagree), PD (Partially Disagree), N (Neutral), PA (Partially Agree), A (Agree), SA (Strongly Agree)

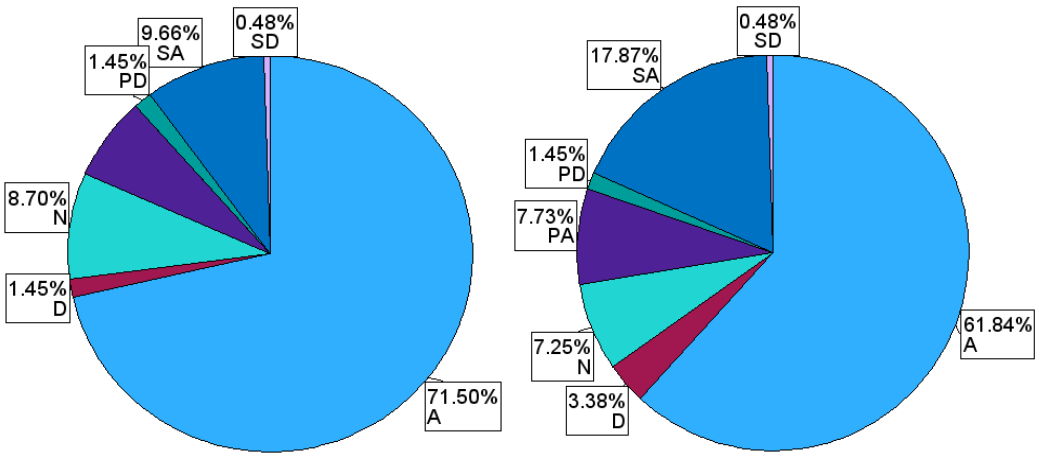

Figure 5: Left (Transformational Leadership Score), Right (Performance Score)

4.4 The Effect of Transformational Leadership on OCB

Table 11 demonstrates that over 60% of respondents supported transformational leadership and OCB questionnaire statement items (**Figure 6**). These findings complement earlier studies indicating transformational leadership improves OCB (Khan et al., 2020; Nurjanah et al., 2020; Budur & Demir, 2022). Grego-Planer (2019) examines employees' emotional involvement in prosocial behavior (OCB) businesses because skill training can help them achieve it. Sri Ramalu & Janadari (2022) found that an inspiring, moral, and expressive supervisor can improve psychological health and stimulate OCB behavior. As a result, researchers confirmed the H2b hypothesis that transformational leadership has a significant positive effect on OCB.

Table 11: Mean Variable Score of Transformational Leadership (TL) and OCB

TL			OCB		
Scale	**Frequency**	**Percent (%)**	**Scale**	**Frequency**	**Percent (%)**
SD	1	0,48	SD	0	0,00
D	3	1,45	D	1	0,48
PD	3	1,45	PD	1	0,48
N	18	8,70	N	11	5,31
PA	14	6,76	PA	9	4,35
A	**148**	**71,50**	**A**	**148**	**71,50**
SA	20	9,66	SA	37	17,87
Total	**207**	**100,00**	**Total**	**207**	**100,00**

Note: SD (Strongly Disagree), D (Disagree), PD (Partially Disagree),
N (Neutral), PA (Partially Agree), A (Agree), SA (Strongly Agree)

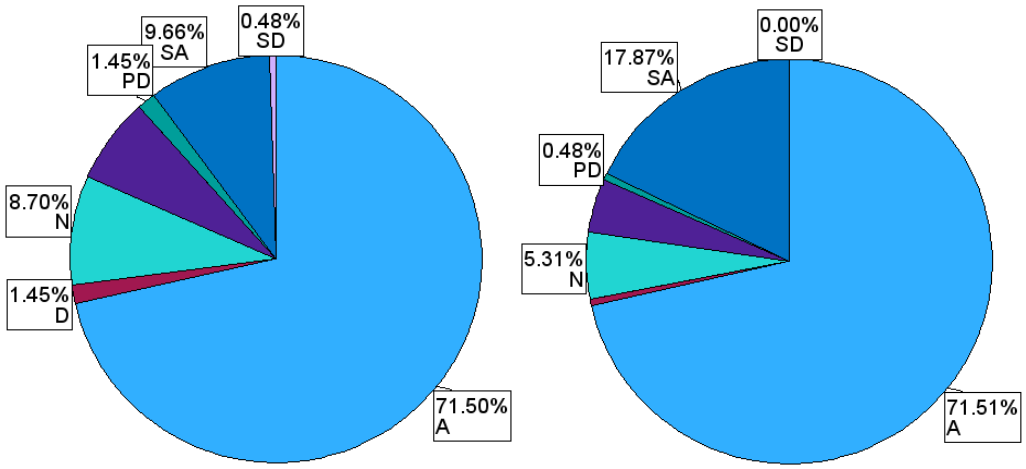

Figure 6: Left (Transformational Leadership Score), Right (OCB Score)

4.5 The Effect of Work Motivation on Performance

As shown in **Figure 7**, **Table 12** demonstrates that over 60% of respondents approve of questionnaire statement items on job motivation and performance. A previous study has shown that motivation improves employee performance, supporting these findings (Alanazi, 2021). Leaders who help people balance their personal and professional lives to reduce mental stress and enhance passion and work effectiveness (Arshad et al., 2021; Bartlett et al., 2022). He has improved his reputation by providing staff development facilities, which encourages excellent behavior and commitment to the organization he serves (Osman et al., 2019; Arshad et al., 2021; Balluerka et al., 2021; Notanubun, 2021). Thus, studies have confirmed the H3a theory that work motivation has a significant positive effect on performance.

Table 12: Mean Variable Score of Work Motivation (WM) and Performance (P)

WM			**P**		
Scale	**Frequency**	**Percent (%)**	**Scale**	**Frequency**	**Percent (%)**
SD	0	0,00	SD	1	0,48
D	8	3,86	D	7	3,38
PD	5	2,42	PD	3	1,45
N	18	8,70	N	15	7,25
PA	16	7,73	PA	16	7,73
A	**139**	**67,15**	**A**	**128**	**61,84**
SA	21	10,14	SA	37	17,87
Total	**207**	**100,00**	**Total**	**207**	**100,00**

Note: SD (Strongly Disagree), D (Disagree), PD (Partially Disagree), N (Neutral), PA (Partially Agree), A (Agree), SA (Strongly Agree)

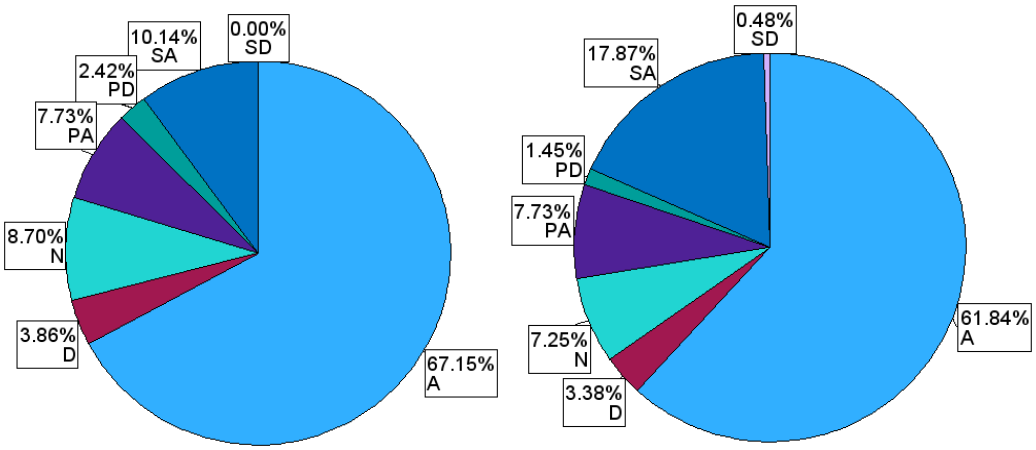

Figure 7: Left (Work Motivation Score), Right (Performance Score)

4.6 The Effect of Work Motivation on OCB

As seen in **Figure 8**, **Table 13** demonstrates that over 60% of respondents agree with job motivation and organizational citizenship behavior (OCB). Previous research corroborates this correlation, suggesting that work motivation enhances OCB (Suharnomo & Hashim, 2019). Teachers and employees feel satisfied and increasingly attached to the organization when bosses provide support, contributions, flexibility, and concern for their well-being (Abdullah & Marican, 2020; Arshad et al., 2021), resulting in harmonious employee relations (Alsheikh & Sobihah, 2019; Jeong et al., 2019; Hermanto & Srimulyani, 2022; Sarfraz et al., 2022). Employee appreciation can motivate the OCB to become more confident (Habeeb, 2019) and to volunteer his time and energy outside of working hours to show his gratitude to the organization (Osman et al., 2019; Arshad et al., 2021; Abdullah & Wider, 2022). As a result, researchers confirmed the H3b hypothesis that work incentives improve OCB.

Table 13: Mean Variable Score of Work Motivation (WM) and OCB

WM			OCB		
Scale	**Frequency**	**Percent (%)**	**Scale**	**Frequency**	**Percent (%)**
SD	0	0,00	SD	0	0,00
D	8	3,86	D	1	0,48
PD	5	2,42	PD	1	0,48
N	18	8,70	N	11	5,31
PA	16	7,73	PA	9	4,35
A	**139**	**67,15**	**A**	**148**	**71,50**
SA	21	10,14	SA	37	17,87
Total	**207**	**100,00**	**Total**	**207**	**100,00**

Note: SD (Strongly Disagree), D (Disagree), PD (Partially Disagree), N (Neutral), PA (Partially Agree), A (Agree), SA (Strongly Agree)

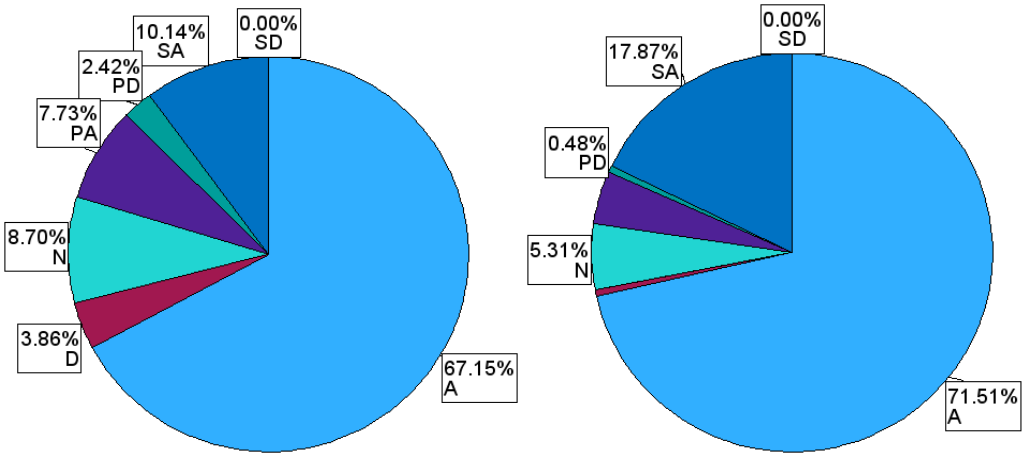

Figure 8: Left (Work Motivation Score), Right (OCB Score)

5. Conclusion

This study found that organizational culture, transformational leadership, and work motivation improve work performance and organizational citizenship behavior (OCB) in Yogyakarta ABA high school teachers and staff. Factor analysis with KMO test yields > 0.50 and Barlett's Test of Sphericity yields <0,001, indicating significant and connected variables. The test continued with an Anti-image Correlation score above 0.5, indicating MSA compliance. Most indicators have an extraction value over 0.5 and are strongly related to the factor formed. After analyzing these aspects, this study's indications match in their variables. The indicators are strongly supportive of each other. These indicators show the significance and association of independent and dependent variables.

Every study variable's average questionnaire results suggest that over 60% of respondents agree. The results demonstrate that ABA kindergarten teachers and staff actively promote school OCB and work performance. Due to its school sector focus, researchers are aware of its limitations. This research should be expanded in additional public sector domains. The researchers anticipate this study will help schools and public sector organizations give high-quality resources from work performance and prosocial behavior or OCB.

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A Regional Development Plan: A Case Study of Douglas County, Kansas, USA

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Abstract
Our research focuses on regional economic growth and development, concentrating on Douglas County, one of the foundational pieces of the Kansas, United States economy. This paper will analyze trends in the County and outline an economic plan for where they should strive to create changes. The method used will compare Douglas County to Kansas and then the United States by industry using a measure called Location Quotient, which measures the strengths and weaknesses of an industry using a ratio matrix. Porter cluster analysis was employed to visualize and analyze how fostering an environment of competition, economic growth, and development will increase productivity, drive business synergy to the industries that need it the most, and stimulate new businesses with economic potential via the results from our Location Quotient analysis within the Douglas County region. Our concluding recommendations will be based on past literature that has commonalities with our finding, providing policymakers, academics, and stakeholders with a spectrum of information while highlighting the Strengths, Weaknesses, Opportunities, and Threats framework. Our finding aims to provide big-picture systemic changes that can be implemented within the County rather than individual or micro changes impacting less of the population.

Keywords: Douglas County, Location Quotient, Porter Cluster, Economic Growth, Economic Development

1. Introduction

Douglas County is home to four research institutions [Baker University, The University of Kansas, WellSpring School of Allied Health, and Haskell Indian Nations University], it is the fifth largest County by population in the State of Kansas, often referred to as a university town, it is home to 119 thousand people (DataUSA, 2023). The four main cities within the County are Lawrence, Baldwin City, Eudora, and Lecompton. The primary aim of this study and its contribution to the field of economic growth and development is to create a data-driven economic [growth and development] action plan that will improve conditions throughout the County and the standard of

living of its residents. This study will employ the Location Quotient analytical framework as a quantitative approach to understanding employment by industry within the County and how it has changed from 2014 through 2021. The identifier will separate industries by their independence in operating in the Douglas County community. A breakdown of the County's Strengths, Weaknesses, Opportunities, and Threats (SWOT) will be created, and potential solutions to issues identified within the County will be provided for policymakers, stakeholders, and academics.

Douglas County covers about 456 square miles (The United States (US) Census Bureau (CB),(US-CB) **2**024). Douglas County was one of the original thirty-three counties created with the founding of Kansas and named after a United States Senator who supported the Kansas-Nebraska Act, Stephen A. Douglas (Legends of Kansas, 2024). The County was heavily involved in disputes related to the Kansas-Missouri Border War from 1854 – 1859 and the American Civil War from 1861 – 1865 (Legends of Kansas, 2024). Focusing on the economy, it is of economic benefit to identify the County's trading partners.

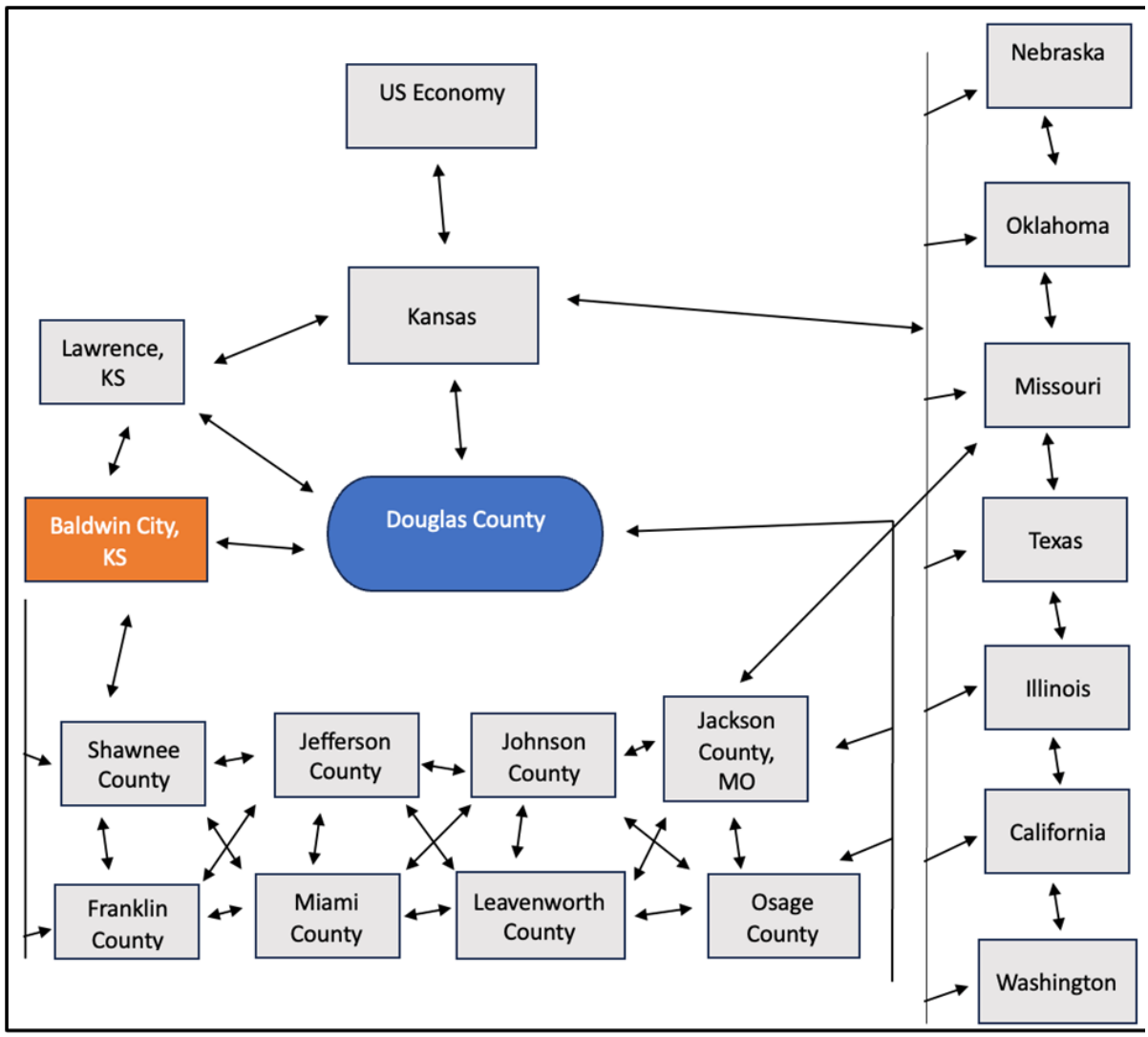

Figure 1: Douglas County Regional Connective to Neighboring Communities

Source: Authors' Creation.

Figure 1 shows the regional connective to neighboring communities according to DataUSA as of 2021 (DataUSA, 2023).

2. Literature Review

According to (Brown, 2006), Location Quotient (L.Q.) is a relevant tool for understanding the dynamics of an industry's exporting and employment strengths. The author states that L.Q. identifies export areas versus import areas, citing 1.25 as a threshold to where that industry can be considered an exporter (Brown, 2006). L.Q. is also valuable for identifying specific sectors within more significant demographics, such as nations or states, distinguishing how individual places can struggle with things considered to be the overall strengths of the region (Brown, 2006). Osiobe, 2018 provides a structural guideline for an in-depth analysis of a county and the strengths presented when using L.Q. to measure industry strengths. Focusing on industry employment size and changes can guide how policy and county-wide changes can create economic strengths from perceived weaknesses (Osiobe, 2018).

Pominova, 2022 writes about the consistency of using location quotients as a measurement and its difficulties and setbacks. Location quotients were said to be best utilized when measuring large areas with sufficient data to describe that region fully. Patrick, 2018 defines essential versus nonbasic industries using location quotient methodology and outlines how to interpret values produced by an L.Q. analysis. An L.Q. of less than one is said not to meet the local consumption and thus must reach outside the economy to satisfy the demand (importing from the external market). An L.Q. of one means the industry's production is at par with the regional market. An L.Q. greater than one shows a surplus in production and can support exporting their goods and services to other regions (Patrick, 2018).

3. Empirical Approach

The analytical measurement used to investigate Douglas County's strengths and weaknesses within its economy will be an economic base analysis. The particular analysis employed will be the L.Q., which shows how concentrated a specific industry or occupation is within a larger subset of data. The analysis timeline will be between 2014 and 2021, broken up among North American Industry Classification System (NAICS) employment categories compared to Kansas and the United States. At the city and county levels, the NAICS codes go to five digits, but at the state and federal levels, they stop at four, creating fewer specific industries and becoming slightly more generalized.

L.Q. will be used to identify industries in Douglas County that are considered both nonbasic and basic. In our study, a nonbasic industries provide services to the economy while exporting from outside the economy, while basic industries are potential exporters and can be considered an economic strength (Brown, 2006).

Equation Specification:

LQ_i	LQ_i Interpretation
Greater than (>1)	Basic industry
Equal to (=1)	Employment satisfies local consumption
Less than (<1)	Nonbasic industry

$$Kansas\ Base = {}^{Douglas\ County\ NACIS}/_{Kansas\ NACIS} \quad \text{……(1)}$$

$$United\ States\ Base = \frac{Douglas\ County\ NACIS}{United\ States\ NACIS} \quad \text{……(2)}$$

$$LQ_i = \frac{(\frac{DC_i}{DC})}{(\frac{K_i}{K})}$$

……(3)

Where:

DC_i = Douglas County employment in a specific industry
DC = Total employment in Douglas County
K_i = State of Kansas employment in a specific industry
K = Total employment in the state of Kansas

$$LQ_i = \frac{(\frac{DC_i}{DC})}{(\frac{US_i}{US})}$$

……(4)

Where:

DC_i = Douglas County employment in a specific industry
DC = Total employment in Douglas County
US_i = United States employment in a specific industry
US = Total employment in the United States

4. Results

Table 1: Location Quotient of Douglas County (Kansas Base) for 2014-2021

Industry	2014	2015	2016	2017	2018	2019	2020	2021
Active-Duty Military	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Agriculture, Forestry, Fishing and Hunting, and Mining	0.39	0.41	0.36	0.36	0.40	0.43	0.36	0.35
Arts, Entertainment & Recreation and Accommodation & Food Services	**1.41**	**1.46**	**1.37**	**1.37**	**1.40**	**1.44**	**1.42**	**1.43**
Construction	0.80	0.76	0.75	0.70	0.70	0.70	0.79	0.70
Educational Services, Health Care & Social Assistance	**1.30**	**1.27**	**1.25**	**1.27**	**1.21**	**1.20**	**1.19**	**1.21**
Finance & Insurance, and Real Estate, Rental & Leasing	0.89	0.96	0.94	0.99	0.93	0.92	0.91	0.91
Information	**1.33**	**1.31**	**1.36**	**1.21**	**1.10**	**1.10**	**1.04**	0.83
	0.54	0.52	0.54	0.53	0.59	0.63	0.60	0.67

Other Services, Except Public Administration	**1.18**	**1.08**	**1.14**	**1.15**	**1.22**	**1.21**	**1.30**	**1.21**
Professional, Scientific & Management, and Administrative & Waste Management Services	**1.19**	**1.23**	**1.14**	**1.15**	**1.13**	**1.08**	**1.18**	**1.23**
Public Administration	0.77	0.84	0.97	0.97	0.94	0.96	0.83	0.80
Retail Trade	**1.08**	**1.08**	**1.14**	**1.15**	**1.20**	**1.17**	**1.14**	**1.08**
Transportation & Warehousing, and Utilities	0.56	0.58	0.66	0.64	0.65	0.70	0.78	0.81
Wholesale Trade	0.67	0.68	0.64	0.60	0.69	0.66	0.64	0.62

Source: Authors' calculation

Table 1 shows the L.Q. results of Douglas County compared to the state of Kansas, with basic industries highlighted in green, potential basic industries in orange, and nonbasic industries in grey. Mostly, all basic industries maintained their status throughout the period (2014-2021) other than information, which became potential basic in 2021. Other basic industries are as follows:

- Arts, Entertainment & Recreation and Accommodation & Food Services
- Educational Services, Health Care, and Social Assistance
- Other Services, Except Public Administration
- Professional, Scientific & Management, and Administrative & Waste Management Services
- Retail Trade

Additionally, a Porter cluster analysis will be created based on the data for Douglas County to represent the shape of its overall economy. According to (Osiobe, 2018), an assistant professor at Baker University, industry clusters "are groups of similar and related firms in a defined geographic area that share common markets, technologies, and worker skill needs, which are often linked by buyer-seller relationships" (Osiobe, 2018). Porter, 1998 states that business models are constantly changing, and businesses are not usually able to build solely horizontally or vertically within the market economy but build in a cluster mass (Porter, **1998**). Identifying where these clusters lie within an economy identifies the strengths in what they can create and do.

Table 2: Location Quotient of Douglas County (U.S. Base) for 2014-2021

Industry	2014	2015	2016	2017	2018	2019	2020	2021
Active-Duty Military	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Agriculture, Forestry, Fishing and Hunting, and Mining	0.57	0.59	0.52	0.53	0.59	0.63	0.52	0.53
Arts, Entertainment & Recreation and Accommodation & Food Services	**1.17**	**1.20**	**1.16**	**1.16**	**1.19**	**1.24**	**1.24**	**1.28**
Construction	0.81	0.77	0.76	0.70	0.70	0.69	0.76	0.67
Educational Services, Health Care & Social Assistance	**1.39**	**1.36**	**1.32**	**1.35**	**1.29**	**1.27**	**1.26**	**1.29**
Finance & Insurance, and Real Estate, Rental & Leasing	0.80	0.86	0.84	0.90	0.86	0.85	0.86	0.87
Information	**1.41**	**1.37**	**1.41**	**1.18**	**1.03**	**1.03**	0.95	0.74
Manufacturing	0.64	0.63	0.65	0.64	0.71	0.77	0.77	0.84
Other Services, Except Public Administration	**1.09**	**1.00**	**1.05**	**1.04**	**1.09**	**1.10**	**1.18**	**1.11**
Professional, Scientific & Management, and Administrative & Waste Management Services	0.96	0.99	0.96	0.97	0.96	0.90	0.96	0.98
Public Administration	0.74	0.82	0.93	0.94	0.93	0.95	0.82	0.80
Retail Trade	**1.03**	**1.03**	**1.07**	**1.08**	**1.12**	**1.11**	**1.06**	**1.03**
Transportation & Warehousing, and Utilities	0.57	0.58	0.63	0.61	0.62	0.66	0.73	0.75
Wholesale Trade	0.69	0.72	0.69	0.64	0.77	0.73	0.68	0.65

Source: Authors' calculation

Table 2 shows the L.Q. results of Douglas County compared to the United States, with basic industries highlighted in yellow, potential basic industries in orange, and nonbasic in grey. The information industry was the only category that transformed from basic to nonbasic from 2014 through 2021. The results show that basic sectors are similar to Table 1. The basic industries are:

- Arts, Entertainment & Recreation and Accommodation & Food Services
- Educational Services, Health Care, and Social Assistance
- Other Services, Except Public Administration
- Retail Trade

Table 3: Porter Cluster Analysis for Douglas County (U.S. Base) 2014-2021

Industry	2021 L.Q.	Percentage change in L.Q. 2014-2021	Percentage of Employment 2021
Active Duty Military	0.00	0.00%	0.00%
Agriculture, Forestry, Fishing and Hunting, and Mining	**0.53**	**-6.11%**	**0.79%**
Arts, Entertainment & Recreation and Accommodation & Food Services	1.28	9.44%	11.81%
Construction	**0.67**	**-17.76%**	**4.16%**
Educational Services, Health Care & Social Assistance	**1.29**	**-7.56%**	**30.58%**
Finance & Insurance, and Real Estate, Rental & Leasing	0.87	9.13%	5.70%
Information	**0.74**	**-47.51%**	**1.42%**
Manufacturing	0.84	30.06%	8.65%
Other Services, Except Public Administration	1.11	1.18%	4.56%
Professional, Scientific & Management, and Administrative & Waste Management Services	0.98	1.90%	11.11%
Public Administration	0.80	7.67%	3.92%
Retail Trade	1.03	0.12%	11.45%
Transportation & Warehousing, and Utilities	0.75	32.86%	4.22%
Wholesale Trade	**0.65**	**-5.76%**	**1.64%**

Source: Authors' calculation

Table 3 and Figure 2 combine to show the Porter Cluster Analysis for Douglas County using a United States base to visualize specific industries' positioning. Industries above the horizontal axis have grown in employment in 2021 since 2014, while those to the right are the basic industries in 2021.

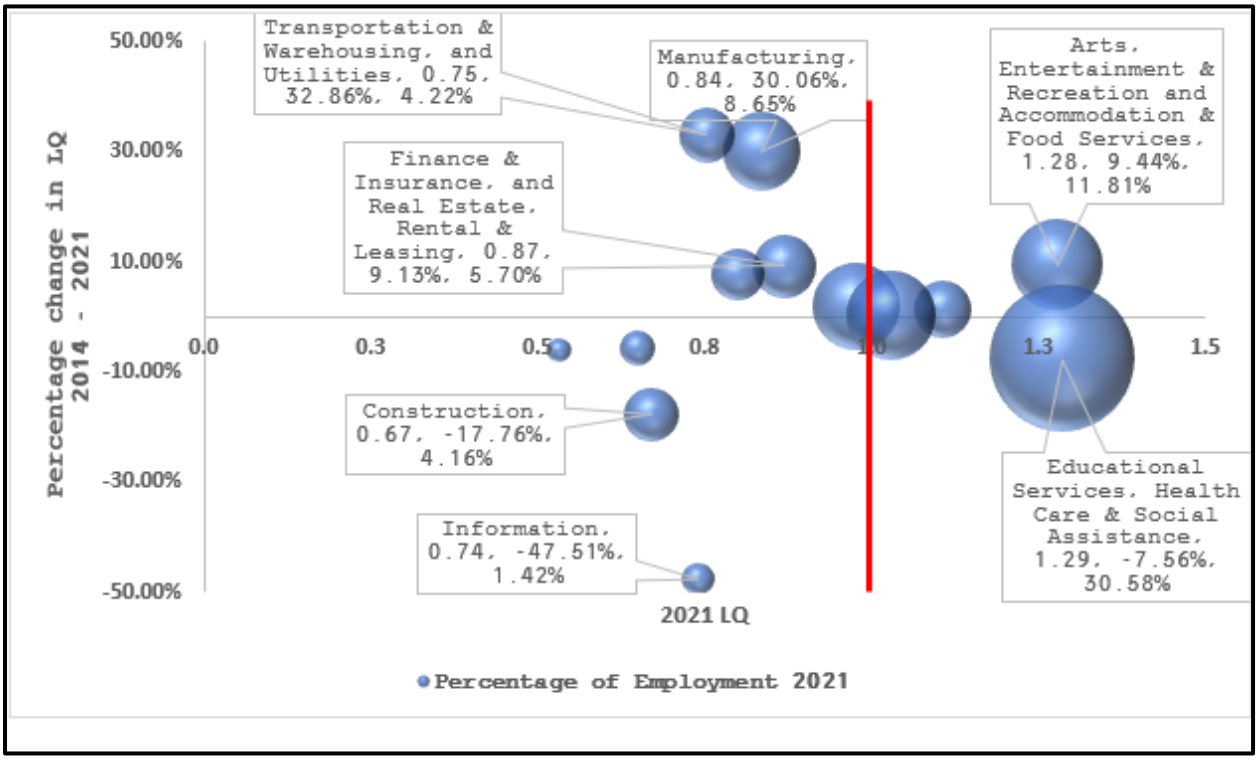

Figure 2: Porter Cluster Analysis for Douglas County (U.S. Base)

Source: Authors' Calculation

The size of the bubble deals with the size of relative employment in the Douglas County economy. Things to notice are the size of the "Arts, Entertainment, Recreation, and Accommodation & Food Services" and "Educational Services, Health Care & Social Assistance" bubbles and where they lay compared to the others. Those are the strong pillars of the Douglas County economy, and they seem to have a firm grasp of that position. Growing industries that are important to note are "Transportation & Warehousing, and Utilities," "Manufacturing," and "Finance & Insurance, real estate and, Rental & Leasing." These specific industries are essential in the continual shift with technology, and further reinforcements through government policy could boost them into the range of becoming basic industries. After researching Douglas County, a SWOT analysis was created through several sources, such as the Baker University Economic Development Office, documents published by the State of Kansas, and other sources that present information about the region. A SWOT analysis is helpful because it diagnoses things from internal (strengths and weaknesses) and external (threats and opportunities) vantage points. Partnering the information presented by the location quotient analysis, the cluster analysis, and the SWOT analysis leads to a position to provide suggestions for Douglas County moving forward.

Table 4: SWOT Analysis for Douglas County

Strengths	**Weaknesses**
- Health care industry - Education industry - Diversity driven by education - Arts and Food industry	- Infrastructure (sidewalks, power supply) - Limited affordable housing - Rural problems with nutrition - Construction and information industries
Opportunities	**Threats**
- Interest rate adjustments - Notoriety with Kansas University athletics	- Lack of farming compared to neighboring areas

- Offering move programs and business loans to attract people/businesses	- Growth of the Kansas City Metropolitan area - Shifting education mindset within American culture

Source:(Osiobe & Joseph, 2023; Osiobe & Dobson, 2023; Osiobe & Ruiz, 2023; Osiobe & Stright, 2023)

The strengths of Douglas County are evident, with all pieces of evidence pointing to the education and healthcare industries as their biggest strengths. Osiobe & Dobson, 2023 analyzed the workforce size by industry comparisons between Baldwin City, Douglas County, and the state of Kansas to identify trends. The authors cited education and health care as strong pillars of the economy. Osiobe & Ruiz, 2023 employed the L.Q. analysis. Their results showed that in Baldwin City, the health care, education, and arts/food industries all qualify as basic industries, showing their importance in that community. Furthermore, DataUSA shows the population breakdown of Douglas County by ethnicity for 2021; most residents are white (77.4% of around 92,000 people) (DataUSA, 2023). Looking at the student diversity available, 29.8% of the degrees awarded in Douglas County in 2021 went to non-white people, showing that although not massive, there is an increase in the diversity of students compared to the overall population, which can be attributed to the university in the area Baker University (DataUSA, 2023).

The L.Q. and Porter cluster analysis highlights weaknesses in Douglas County, primarily centered around the construction and information industries and their relative decline. In the eight years covered by the study, the construction and information industries have experienced a 17.8% and 47.5% decrease in employment, respectively. Douglas County has areas that struggle with a lack of infrastructure, such as the lack of energy creation and neglect of sidewalks, which are issues noticed by residents (Osiobe & Ruiz, 2023). Osiobe and Joseph, 2023 found that population fluctuation in Baldwin City that limited affordable housing is one of the economy's most significant issues. As Baldwin City is a smaller part of Douglas County, this issue is not far from the overall scope of the current expensive housing market that the United States is dealing with. The most significant weaknesses of the County currently are (but are not limited to) "limited safe and affordable housing," "inadequate transportation linking people to services, jobs, and recreation," and "lack of access to affordable, healthy foods" (Collie-Akers, **2012**). If Douglas County could implement a form of transportation that can provide trustworthy and reliable transit between Lawrence and its smaller communities (such as Baldwin City or Perry), it would help alleviate some of the concerns. Other measures to combat said problems are to create competition within these smaller towns by attracting larger retail stores or additional markets to compete against the high prices of these individualized sellers. When buyers have choices, ideally, prices would fall for desired healthy goods that would benefit the residents of these communities outside of Lawrence.

Douglas County's overall opportunities to improve the economy would be to address some of the identified issues that have slowed the creation of new businesses in the area. Giving more favorable and affordable business and individual interest rates would be a step in the right direction. Osiobe and Dobson, 2023 highlight the struggles of the financial industry in Douglas County as consumer preferences have shifted from physical bank locations to mobile banking (Osiobe & Dobson, 2023). In the interest of attracting outsiders to Douglas County, financial institutions should consider offering a higher interest rate to investors on finances kept within county lines to increase the amount of liquid capital available to them and, ideally, reinvest in the community. It can be risky, as an increase that is too high can cause a collapse. Still, if financial institutions could attract some of that money that has left and gone "digital," it could benefit the community when banks can give back. Another opportunity to improve Douglas County would be offering financial literacy programs at a discounted rate through partnering institutions. With the resources and coursework already created at universities (like Baker University), why not have local government providing access or, at the very least, promoting these programs to encourage smart money habits and techniques that can help any citizen regardless of occupation?

Another potential opportunity for Douglas County is the recent rise to prominence of some Kansas University athletic teams. On a macro scale, it is easy to understand that Kansas University is the backbone of the Douglas County economy, highlighted by the 35.9 million dollars the university spent on research-related spending within Douglas County in 2022 (Paget, **2023**). As sports are one of the main attention-getters for the average consumer,

the additional attention that the university's Football teams are attracted nationally can create an advertising effect for the region if appropriately executed. If local government could create attractive media commercials to attract businesses and consumers to explore Douglas County on local and potential national broadcasts, it could increase population and business retention. By creating affordable housing, the government can increase its population and reduce the number of college students leaving the area after graduation, which the County can benefit from on a larger scale (Osiobe & Joseph, 2023). The authors also found that young people are likelier to stay local to their college location if affordable housing options have proper socialization and competitive employment opportunities. As shown by the L.Q. data about employment opportunities, investments into the declining fields (highlighted in yellow in Table 3) can help incentivize young graduates to consider staying local in Douglas County and strengthening the region. According to (Osiobe & Straight, 2023), It is recommended that governments offer incentive programs or tax breaks to startup companies to make starting a business in the area more appealing. Suppose Douglas County were to take some of these suggestions and put them to use in declining fields. In that case, it can help balance their economy with the industries that are losing employment while granting a higher chance at retaining talent created at local institutions.

Talking about some of the threats that Douglas County faces, looking at the economy of Kansas, it is noticeable that Douglas County has a significantly lower amount of farming and agriculture. Agriculture-related employment is around 18% of Kansas' employment, but in Douglas County, it is only 1% (Osiobe & Dobson, 2023). It is noted that Douglas County does not have the same amount of land dedicated to farming as other counties within the state. Still, if there were to be an increase in the price of importing foods, Douglas County may be hit harder than neighboring counties constructed differently. Douglas County residents and officials should be mindful of the growth of the Kansas City Metropolitan (K.C.) area as it continues to grow in population and diversity. With many attractions and businesses deciding that the geographically local area is a better place to create a business or raise a family, the County needs to find ways to stick out to K.C.'s residents. With nearly 3 million people within an hour of Douglas County, it would be wise to find partnerships with the K.C. area rather than try to compete with it.

Arguably, the most critical threat that Douglas County faces is the shifting mindset of the American youth who are deciding to go to college less than they were before. Richard Fry at the Pew Research Center conducted a 2022 study on the enrollment rates of high school graduates and found an 8% and 4% decrease in enrollment rates among men and women, respectively, from where they were in 2011. Although more high schoolers graduate yearly, fewer are deciding to go the traditional education route due to inflating costs, lower attention spans, and lack of desire (Fry, **2023**). With so much of the attraction related to Douglas County attached to its universities, declining enrollment rates could drastically affect the economy. Douglas County needs to be wise in aiding these institutions in monitoring costs to mitigate the risk of students deciding that the education is not worth the financial burden.

5. Conclusion

Douglas County possesses many great traits and opportunities that outrank other Kansas communities. The education and healthcare industries are the most renowned fields within the County. At the same time, educational institutions are instrumental in furthering the area's development and stimulating economic growth—the L.Q. measures highlight industries such as manufacturing and financial institutions, which are growing steadily. In contrast, the construction and information industries need support. A Porter cluster analysis shows the visual position of specific industries in Douglas County compared to the United States. Douglas County has the opportunity to address some of its identified problems by implementing transit to and from Lawrence and inviting businesses to help populate smaller cities. Proper county initiatives and planning can neutralize affordable housing concerns and a relative weakness in agriculture compared to the state. This paper can help policymakers, academics, and stakeholders by bringing attention to underaddressed issues, residents of Douglas County by showing their strengths and shortcomings, and academia by showing what a plan of this structure can do for comparable communities. If Douglas County were to help strengthen identified industries and nurture them into basic industries, it could appeal to outsiders, help grow their population, and bolster the region for decades.

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Student Viewpoints Regarding Distance Learning

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Abstract
This study aims to examine potential disparities in student perspectives towards distance learning precipitated by the significant shifts in educational dynamics. The sample comprises 709 students hailing from diverse universities in Bandung Indonesia, selected through snowball sampling. Prior to hypothesis testing, validity and reliability assessments are conducted. The distribution of student responses concerning distance learning is scrutinized utilizing the Anova test, investigating variances in perspectives based on academic batch and university type. The findings affirm discernible differences in students' perspectives on distance learning relative to their academic batch and university type.

Keywords: Distance Learning, Academic Batch, Type of University

1. Introduction

Previous studies have highlighted challenges such as disparities in educational quality, unequal access to technology among students for distance learning, and variations in students' technological preparedness (Syahruddin et al., 2021). Additionally, there is evidence suggesting that students who struggle academically in traditional face-to-face settings are more prone to lower academic performance in distance learning environments (Mohd Basar et al., 2021). The abrupt and unforeseen shifts in educational settings present an opportunity for academic institutions to innovate their teaching methods by harnessing current technology. Consequently, the transition from traditional in-person classes to distance learning poses both challenges and prospects that warrant deeper examination. This study aims to delve into the advantages and obstacles of remote learning from the perspective of students. Distance learning, as defined by Al-Mawee et al. (2021), involves utilizing technology for instruction, wherein students are physically distanced from face-to-face interactions and transition to online platforms. Such programs can either be entirely web-based or a blend of virtual and in-person sessions, known as hybrid learning. This approach not only enables educators to reach a broader audience but also offers students greater flexibility in their academic pursuits. While online education falls within the spectrum of distance learning, often referred to as e-learning, it represents just one facet of this multifaceted approach.

Furthermore, research indicates that students experience a heavier workload during distance learning compared to traditional face-to-face instruction. Numerous studies have explored students' perceptions of distance learning. Conversely, in addressing the inquiry into students' experiences during distance learning, researchers undertook a qualitative research synthesis to gather insights from ten articles, summarizing their content and distilling key findings (Blackmon & Major, 2012). These findings revealed that students often juggled domestic responsibilities alongside their studies and reported difficulty in grasping abstract learning materials. However, some students

demonstrated success in adapting to distance learning. Educators, therefore, hold a crucial role in fostering innovative online environments conducive to the acquisition and application of new cognitive skills. Satisfaction with various online asynchronous activities, including video recordings, exam information, interaction with teaching staff, and updates from social media platforms, significantly contributes to students' satisfaction with the university's response during the Covid-19 pandemic (Aristovnik et al., 2020).

Students cited numerous benefits of distance learning, including time savings, enhanced schedule flexibility, increased course load capacity, independent study opportunities, temporal and spatial flexibility, and often lower attendance costs (Aguilera-Hermida, 2020). Conversely, drawbacks included technological and internet limitations, diminished face-to-face interaction (Das, 2023), feelings of isolation, attention challenges, and delayed feedback (De Paepe et al., 2017; Gillett-Swan, 2017; Barrot et al., 2021). Previous research offers several recommendations, including universities offering diverse learning modalities (face-to-face, online, hybrid) to cater to student preferences, continued professional development for faculty (Philipsen et al., 2019; El Islami et al., 2022), providing the distance learning process with adequate social support and motivation, instead of only providing synchronous or only asynchronous practice (Çankaya & Yünkül, 2017; Amiti, 2020; Zeng & Luo, 2023); considering students who have complex needs and special needs, trying to open communication channels between administrators, educators, and students, as well as improving mental health programs and providing proactive psychosocial assistance to students (Amiti, 2020; Zeng & Luo, 2023). Focusing on a specific academic term, researchers investigated graduate students' perceptions of distance learning through online survey analysis (Fedynich et al., 2015). Their findings underscored the significance of teacher engagement, student-teacher interaction, and feedback mechanisms in shaping learner satisfaction

In the study, the null hypothesis (Ho) posits that there is no variance in students' perceptions of distance learning questions based on batch and university type. Conversely, the alternative hypothesis (H1) suggests differences in students' perspectives based on batch and university type. The null hypothesis is rejected if the significance value is ≤ 0.05.

2. Research Method

This study employs a descriptive comparative research methodology aimed at addressing current challenges. Descriptive research serves to uncover novel insights, elucidate existing conditions, ascertain the frequency of occurrences, and classify informational patterns. Its objective is to elucidate or outline research issues arising from the characteristics of individuals, locations, and time periods. Specifically, this research seeks to elicit responses from participants regarding their perspectives on distance learning.

The study population comprises all actively enrolled students at various universities in Bandung. Given the limited availability of secondary statistical data up to the commencement of the research, the researchers presumed the research population to be infinite. Utilizing a 5% tolerable error rate, the Herry King Nomogram table was consulted, indicating a minimum sample size of 349 individuals. The research adopts a snowball sampling approach, whereby respondents are identified through networking with individuals having direct or indirect associations.

The questionnaire comprised demographic inquiries, Likert scale assessments, and open-ended prompts. Participants provided responses to four demographic queries concerning gender, age, academic batch, and university type. Additionally, they rated items on a five-point scale ranging from "Strongly Agree" to "Strongly Disagree." Moreover, respondents were tasked with addressing open-ended inquiries. Measurement of distance learning encompassed variables such as flexibility (five questions), expansion (four questions), student interaction (two questions), and technology utilization (two questions). Evaluation of instructional methods included inquiries regarding instructor involvement (four questions), distance learning tools (two questions), and preferences for distance learning methods (four questions).

The researchers conducted a comprehensive data collection process utilizing literature reviews and surveys. They initiated a contextual review, a method wherein the researcher situates a specific study within broader scholarly

discourse by examining analogous or related prior studies, thus forming a research framework (Snyder, 2019; Zekaj, 2023). In this study, the researchers systematically searched, read, and analyzed scholarly articles available in university-facilitated journals and conducted searches through search engines like Google. This approach aimed to identify, comprehend, and integrate conceptual and empirical insights relevant to the research topics and variables. These findings served as a foundation for structuring theoretical frameworks and guiding the preparation, design, and execution of the research in a coherent and comprehensive manner.

The researchers administered surveys through the compilation and distribution of written questionnaires, aiming to gather information on respondents' backgrounds, beliefs, and behaviors. In this study, the researchers assembled and disseminated a questionnaire in the form of a Google Forms, distributing it to relevant parties capable of reaching the target respondents. This approach considered the ongoing implementation of online or distance learning in the academic setting and aimed for a broad research sample coverage, specifically targeting the Bandung area, the capital of West Java. By disseminating questionnaires virtually via a link, the researchers sought to enhance the efficiency and precision of data collection in alignment with current circumstances. To ensure effective questionnaire completion, the researchers collaborated closely with intermediary parties, providing explanations directly to respondents when necessary through virtual platforms such as social media.

Validity testing in this study involved scrutinizing the correlation between item scores and the overall score. Reliability assessment was conducted using the Cronbach alpha coefficient, which gauges inter-item consistency and measures respondents' consistency across all questionnaire items. Reliability interpretation suggests that a Cronbach alpha value exceeding 0.8 indicates excellent reliability, while a value between 0.6 and 0.8 denotes acceptable or good reliability. A Cronbach alpha value below 0.6 indicates poor reliability. The distribution of students' responses to distance learning was analyzed using ANOVA (analysis of variance), a statistical method that examines the relationship between a metric-dependent variable and one or more non-metric or categorical independent variables.

3. Results and Discussion

This section delineates the attributes of participants along with the outcomes of validity, reliability, and ANOVA assessments. Table 1 illustrates the demographic profile of respondents, totaling 709 individuals.

Table 1: Recapitulation of Research Respondent Characteristics

Profile	Absolute Number (People)	Relative Amount (%)
Gender		
Male	286	40,4
Female	423	59,6
Age (years old)		
16-17	22	3,1
18-19	343	48,3
≥ 20	344	48,6
Domicile		
Bandung	431	60,7
Out of Bandung	278	39,3
Batch		
< 2018	36	5,1
2018	25	3,5
2019	116	16,4
2020	125	17,6
2021	227	32,0
2022	180	25,4
University		
Private	562	79,2
Public	147	20,8

Source: Processed research data (2022)

The r (correlation) value ≥ 0.300, which ranges from 0.469-0.742 with a significance value of 0.000 ≤ 0.05 and the Cronbach Alpha coefficient value is 0.918. Referring to this value, the questionnaire designed by the researchers is valid and reliable.

Table 2: Levene's Test of Equality of Error Variances
(Batch and Type of University)

Dependent Variable: Distance Learning

	F	df1	df2	Sig.
Batch	1.209	5	703	.303
Type of University	.200	1	707	.655

Before employing the ANOVA test, it is imperative to ensure that the assumption of homogeneity of variance, assessed through the Levene test, is satisfied. The F-test value for batch (refer to Table 2) is 1.209, with a significance value of 0.303, which is greater than 0.05. Similarly, the F-test value for the type of university (refer to Table 2) is 0.200, with a significance value of 0.655, also exceeding 0.05. These results indicate that the assumption of ANOVA, namely uniform variance, is upheld.

Table 3: Tests of Between-Subjects Effects (Batch and Type of University)
Dependent Variable: Distance Learning

Source	F	Sig.
Intercept	12358.577	.000
Batch	4.018	.001
Intercept	14298.170	.000
Type of University	15.076	.000

The computed F-value derived from the analysis of between-subject effects concerning the group (refer to Table 3) is 12358.577 for the intercept, with a significance value of 0.000, indicating ≤ 0.05 significance. Similarly, the calculated F-value for the variable "force" is 4.018, with a significance value of 0.001, also indicating ≤ 0.05 significance. This suggests that the academic batch significantly influences respondents' perceptions of distance learning, indicating variations in their responses across different batches. These findings align with previous research results (Muthuprasad et al., 2021; Buttler et al., 2021; Kirsch et al., 2021; Al-Mawee et al., 2021).

Likewise, the computed F-value from the analysis of between-subject effects based on the type of university (refer to Table 3) is 14298.170 for the intercept, with a significance value of 0.000, indicating ≤ 0.05 significance. Additionally, the calculated F-value for the type of university variable is 15.076, with a significance value of 0.000, also indicating ≤ 0.05 significance. This implies that the type of university significantly influences respondents' perceptions of distance learning, indicating variations in their responses based on university types. These findings are consistent with previous research outcomes (Muthuprasad et al., 2021; Buttler et al., 2021; Kirsch et al., 2021; Al-Mawee et al., 2021).

The research outcomes concerning the impact of academic batches reveal that a significant portion of incoming students perceive a diminished level of interaction between peers and instructors following the transition to distance learning, whereas students from other batches perceive adequate interaction. Regarding academic advancement and achievement, a majority of incoming students express more negative sentiments compared to their counterparts from other batches. Specifically, incoming students indicate a perception of inadequate learning outcomes in distance learning settings, highlighting a disparity in academic performance compared to face-to-face instruction. This discrepancy may stem from higher education institutions' unpreparedness to address the unprecedented challenges posed by the pandemic, exacerbated by the lack of comprehensive information on best practices and effective assessment methods that are still in developmental stages.

Conversely, students across all academic batchs expressed favorable views regarding the flexibility afforded by distance learning concerning class attendance and assignment completion. Notably, senior students exhibit a greater appreciation for the flexibility of distance learning compared to their newer counterparts. The advantages of distance learning, particularly in terms of flexibility regarding location and timing, encompass reduced commuting time, cost savings on transportation, enhanced time management, and increased opportunities for family engagement. Moreover, heightened flexibility has been observed to foster independent learning among students. Regarding access to reliable distance learning resources, the majority of students reported possessing internet connectivity and access to a computer or device dedicated to distance learning, with only a minority lacking personal computing devices. Equitable access to the internet and essential tools is crucial for students engaged in distance learning. Furthermore, findings indicate that senior students hold more positive perceptions than new students regarding the utilization and proficiency in platforms such as Zoom and Teams, serving as Learning Management Systems (LMS). Enhancing the perception and adoption of distance learning technologies can be facilitated through comprehensive training programs for both faculty and students, recognizing the increasingly integral role of digital technology in higher education institutions.

The results obtained from students' viewpoints regarding the available distance learning modalities indicate that a significant portion of students, particularly those who are new to the system, express highly positive inclinations towards opting for face-to-face or hybrid classes as opposed to strictly online ones. The preference for hybrid classes has been shown to enhance comprehension of the learning process, primarily due to heightened social interaction among peers and instructors. Conversely, a majority of students, especially those in their senior years, exhibit favorable inclinations towards online classes. New students, however, express negative sentiments towards asynchronous learning methods. There is a pressing need for ongoing assessment of students' preparedness for various online learning formats, considering factors such as aptitude, technological proficiency, self-directed learning capabilities, motivation, and perceived utility.

Regarding the impact of university type, the findings highlight that interactions with classmates are perceived unfavorably across all types of institutions, albeit private universities report less favorable perspectives compared to public ones. On the flexibility scale of distance learning, students from private universities display a positive rating for the statement suggesting that distance learning allows for more efficient time management. The disparities observed in distance learning evaluations across different types of universities underscore a primary challenge faced by distance learning, namely, the creation of comprehensive and inclusive learning experiences tailored to meet the diverse needs of students. These needs tend to vary based on institutional type or subject matter.

4. Conclusion

This study sought to elicit insights from university students in Bandung Indonesia regarding their experiences with distance learning. These findings carry significant implications for educators and university leadership, aiding in the evaluation of distance learning initiatives and informing future decisions aimed at addressing its shortcomings. Educators are urged to tailor their approaches based on factors such as academic batch and institutional type to better cater to students' needs, encompassing improved instructional methods, appropriate assessment strategies, opportunities for interpersonal interactions, small-group discussions, collaborative projects, and group presentations. By adopting such strategies, educators can enhance student outcomes and mitigate challenges associated with distance learning. On the student front, factors such as adaptability to campus life, personal accountability, peer relationships, and time management skills emerge as pivotal influencers of the student experience. This research was conducted following two years of distance learning implementation in Bandung universities. Moving forward, further investigation could explore potential shifts in student perceptions over subsequent academic years.

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Impulse Buying: How Generation Z's Enjoyment of Shopping Affects Their Fashion Buys

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Abstract
This study examined the determinants that impact Generation Z's impulsive purchasing of fashion products. Implementing Stimulus Organism Responses (SOR), the research model is structured as Structural Equation Modelling (SEM). External stimuli include Price Discounts and Store Environment, with Shopping Enjoyment mediating between Hedonic Shopping Motivation and these two factors. In total, 444 students between the ages of 18 and 22 participated. Form questionnaires were distributed to 30 WhatsApp group classes to collect the data. Hedonic shopping motivation, price discount, and store environment contribute to an enjoyable shopping experience, stimulating impulsive purchasing. The determinant influencing impulsive purchasing is the store atmosphere. Impulse buying behavior is carried out using the stimulus organism response (SOR) theory approach. One of the stimuli used in the research model, the online store atmosphere, is still not widely studied.

Keywords: Consumer Behavior, Hedonic Shopping Motivation, Impulse Buying, Online Shopping, Price Discount, Shopping Enjoyment, Store Atmosphere Online

1. Introduction

Impulse buying behavior has been a phenomenon that has attracted attention in consumer behavior research over the past decades (Shen and Khalifa, 2012; Mohan, Sivakumaran and Sharma, 2013; Peng and Kim, 2014; Atulkar and Kesari, 2018; Hashmi, Shu and Haider, 2020; Lee and Chen, 2021; Aiolfi, Bellini and Grandi, 2022; Kumagai and Nagasawa, 2022; Lin et al., 2022; Sun, Li and Sun, 2023). The impulse buying phenomenon is mainly due to lifestyle changes and technological developments affecting people's shopping. Generation Z is influenced by impulse buying behavior (Djafarova and Bowes, 2021; Munsch, 2021; Zhang et al., 2021). They are a generation born and raised in the digital era, often called digital natives.

The materialistic nature of Generation Z (Flurry and Swimberghe, 2016), sensitivity to trends and lifestyles, and constant desire to appear fashionable motivate this demographic to purchase items that express their individuality (Djafarova and Bowes, 2021). Muhammad et al. (2023) found that Generation Z is susceptible to the positive stimuli that fashion products frequently provide; these stimuli are commonly linked to trends and social, environmental, and multicultural concerns (Johnson and Im, 2014; Razzaq et al., 2018; Slater and Demangeot, 2021) elicitation of positive emotions in response to a positive stimulus induces impulsive purchasing (Gupta and Gentry, 2018; Muhammad, Adeshola and Isiaku, 2023). Therefore, Generation Z is a consumer group susceptible to impulsive purchasing (Djafarova and Bowes, 2021; Munsch, 2021; Zhang et al., 2021).

Conversely, impulse buying demonstrates the seller's proficiency in executing his sales strategy (Aiolfi, Bellini and Grandi, 2022). Research on impulse buying is crucial for businesses to comprehend consumer behavior and ensure their continued existence. The fashion industry is currently marked by intense competition, as evidenced by the proliferation of online retailers carrying a wide range of brands. The fashion industry may have a market expansion opportunity with the 41 percent share of Generation Z. In addition, numerous studies have demonstrated that Generation Z actively purchases and consumes goods from a variety of online marketplaces; thus, it is considered one of the most influential consumer groups (Nghia, Olsen and Trang, 2020; Azhar et al., 2023; Van den Bergh, De Pelsmacker and Worsley, 2023).

Several scholarly investigations have been undertaken to examine the purchasing patterns of Generation Z through the lens of generational cohort theory, which emphasizes the characteristics of cohorts (Ismail et al., 2020; Agrawal, 2022; Thangavel, Pathak and Chandra, 2022; Van den Bergh, De Pelsmacker and Worsley, 2023). Another approach used is the Theory of Planned Behavior (Djafarova and Foots, 2022; Pradeep and Pradeep, 2023; Suzianti, Amaradhanny and Fathia, 2023); the theory of Acceptance Model (Lestari, 2019), which uses the gratification theory (Siregar et al., 2023), and social commerce adoption model that focuses on specific platforms (Azhar et al., 2023). An additional study employs Stimulus Organism Response (SOR) Theory to comprehend the purchasing patterns of Generation Z as deviant behavior from a clinical standpoint ((Mason et al., 2022).

Regarding the impulse purchasing behavior of Generation Z, Abdelsalam et al. (2020) suggest in a meta-analysis that four factors warrant investigation: site performance, marketing strategies, consumer characteristics, and social factors. Redline et al. (2023) propose a similar notion, stating that the antecedent variables of impulse purchasing behavior consist of sociodemographic factors, marketing mix, store-related factors, online peer influence, and consumer-related factors. These studies prove that external and internal elements can influence impulse purchasing behavior. External factors include marketing strategies and shopping environments, while internal factors involve consumer characteristics. Within online shopping, the subsequent stimuli will foster impulsive buying behavior (Chan, Cheung and Lee, 2017). Subsequently, the Stimulus Organism Response (SOR) model offers a coherent framework for the assessment of the model within the scope of this investigation (Lee & Chen, 2021; Shetu, 2023; Zafar et al., 2021, 2023).

This study examined the determinants that impact Generation Z's impulsive purchases of fashion products. This behavior is a compelling subject of investigation due to its potential to inform marketers, among others, in creating consumer-centric marketing strategies that effectively target Generation Z as a prospective market.

1.1. Conceptual Framework And Hypotheses

1.1.1. Impulse Buying

Impulsive buying is a consumer's irrational behavior (Wells, Parboteeah and Valacich, 2011; Hashmi, Shu and Haider, 2020). Several variables, including the shopping environment (Mohan, Sivakumaran and Sharma, 2013; Atulkar and Kesari, 2018; Geng et al., 2020; Hashmi, Shu and Haider, 2020; Xiao et al., 2022), hedon behavior (Peng and Kim, 2014; Lee and Wu, 2017; Vieira, Santini and Araujo, 2018; Çavuşoğlu, Demirağ and Durmaz, 2020; Hashmi, Shu and Haider, 2020; Park and Lin, 2020; Kumagai and Nagasawa, 2022; Lin et al., 2022; Sun, Li and Sun, 2023) are hypotheses that influence impulse buying. Previous research has established a correlation between impulsive buying and marketing tactics, including the implementation of discounted pricing (Sheehan et

al., 2019; Büyükdağ, Soysal and Kitapci, 2020; Çavuşoğlu, Demirağ and Durmaz, 2020). In addition, an enjoyable experience on one of the e-commerce platforms may stimulate impulsive purchases (Atulkar and Kesari, 2018; Hashmi, Shu and Haider, 2020; Lee and Chen, 2021; Lin et al., 2022).

1.1.2. Stimulus Organism Response (SOR)

Stimulus-organism response (SOR) Theory is a conceptual framework utilized to elucidate the mechanisms by which organisms react to stimuli, subsequently generating distinct behavioral responses ((Russell and Mehrabian, 1974). Within the marketing realm, this stimulus will increase consumers' propensity to categorize, interact with, and identify pages and their desire to revisit the page to purchase products or conversely (De Luca and Botelho, 2021). Product categories, pricing, discounts, brand advocates, and website functionalities are examples of marketing, social, and technological strategies that constitute external stimuli on e-commerce platforms (Chan, Cheung and Lee, 2017; Büyükdağ, Soysal and Kitapci, 2020; Zafar et al., 2021; Lin et al., 2022) The stimulus may also manifest as an intrinsic internal factor that is personal, as exemplified by the characteristics of the hedon (Peng and Kim, 2014; Lee and Wu, 2017; Vieira, Santini and Araujo, 2018; Çavuşoğlu, Demirağ and Durmaz, 2020; Hashmi, Shu and Haider, 2020; Park and Lin, 2020).

The term "organism" in the SOR model refers to the individual or person who responds to the stimulus (Russell and Mehrabian, 1974). The organism is an active and mediating factor that processes the stimulus and generates a response based on internal feelings or behavior (Russell and Mehrabian, 1974; Shen and Khalifa, 2012; Richard and Chebat, 2016; Chen et al., 2019; Hashmi, Shu and Haider, 2020). The organism plays a crucial role in shaping the response to a stimulus, and various factors, such as emotions and cognitive processes, can influence the answer. Internal processes in the organism can be both affective and cognitive. The existing literature highlights that emotions play a central role during impulse purchases compared to cognition (Floh and Madlberger, 2013). Therefore, this study highlights the affective process of the stimulus that will elicit a sense of pleasure as an emotional reaction during impulse purchases (Chan, Cheung and Lee, 2017; Li, Wang and Cao, 2022).

Consumer response, as defined by De Luca and Botelho (2021), can manifest as either approach or avoidance behavior. In the context of this research, response was utilized as a surrogate for impulsive purchases (see also Zafar et al., 2021). A consumer adheres to the behavioral approach by conducting a product search on the webpage, culminating in completing the purchase process. Behavior that avoids is the antithesis.

1.1.3. Hedonic Shopping Motivation

Hedonic Shopping Motivation is a person's drive or motivation to shop because they seek pleasure, personal satisfaction, or positive experiences gained from shopping (Peng and Kim, 2014; Vieira, Santini and Araujo, 2018; Iyer et al., 2019; Çavuşoğlu, Demirağ and Durmaz, 2020; Hashmi, Shu and Haider, 2020; Kumagai and Nagasawa, 2022) Several studies show that hedon properties are one of the internal factors that drive impulse buying (Peng and Kim, 2014; Lee and Wu, 2017; Vieira, Santini and Araujo, 2018; Çavuşoğlu, Demirağ and Durmaz, 2020; Hashmi, Shu and Haider, 2020; Park and Lin, 2020) When someone has a solid hedonic motivation to shop, they tend to experience higher levels of satisfaction during the shopping process (Vieira, Santini and Araujo, 2018; Kumagai and Nagasawa, 2022) The level of satisfaction will provide a positive and pleasant experience in shopping. Based on this, the first hypothesis that can be made is that *hedonic shopping motivation is predicted to increase shopping enjoyment*.

1.1.4. Price Discount

Price is commonly regarded as a determinant of purchasing choices (Sheehan et al., 2019; Büyükdağ, Soysal and Kitapci, 2020; Çavuşoğlu, Demirağ and Durmaz, 2020). Sellers may employ a discount price strategy to stimulate impulse buying (Lee & Chen, 2021; Lin et al., 2022; Peng & Kim, 2014). The magnitude of the discount affects purchase intentions dynamically over an online shopping experience, indicating that consumers enjoy the process of finding and using discounts (Sheehan et al., 2019). In online shopping, consumers always look for the best deals, as the price is an attractive stimulant in this environment (Atulkar and Kesari, 2018; Aiolfi, Bellini and

Grandi, 2022). Discounts can be considered an incentive to get people to shop, making shopping more enjoyable and satisfying (Lee & Chen-Yu, 2018). Discounts can enhance the emotional experience of online shopping, stimulate purchase intentions, and increase the enjoyment of the shopping process (Huo et al., 2023; Lee & Chen-Yu, 2018; Venkatesh et al., 2021). As a result, the second hypothesis that can be formulated based on the findings of this study is that *price discounts are predicted to increase shopping enjoyment*.

1.1.5. Store Atmosphere

A store atmosphere is an environment that is intentionally crafted to impact the mood and conduct of customers (Ahmed and Ting, 2020; Albarq, 2021; Calvo-Porral and Lévy-Mangin, 2021; Xiao et al., 2022). Aspects of an online store's ambiance consist of page layout, navigation, colors, fonts, images, and videos(Zhao et al., 2022) These characteristics are expected to create a positive shopping experience that encourages customers to surf, shop, and buy products (Lin et al., 2022) The level of interactivity and information technology (IIT) of an online store can affect consumer perception of the online retail environment, shopping enjoyment, and patronage behavior towards online retailers ((Kim, Fiore and Lee, 2007) So if during surfing consumers feel a positive experience, then a sense of pleasure will arise during shopping. Therefore, it can be hypothesized that *the quality of the store atmosphere is predicted to increase shopping enjoyment*.

1.1.6. Shopping Enjoyment

Shopping enjoyment pertains to the degree of gratification or pleasure an individual experiences while engaging in the activity of shopping (Kim, Fiore and Lee, 2007; Floh and Madlberger, 2013; Mohan, Sivakumaran and Sharma, 2013; Badgaiyan and Verma, 2014; Atulkar and Kesari, 2018; Hashmi, Shu and Haider, 2020) Based on previous research, it is said that hedonic shopping motivation, price discounts, and store atmosphere are predicted to increase shopping enjoyment. Experiencing pleasure while shopping manifests positive emotions that impair rationality, judgment, and self-control, compelling consumers to engage in excessive shopping (Becker & Bernecker, 2023; Lee, Gan, & Liew, 2023). Experiencing this degree of delight in shopping may inspire impulse buying (Horváth and Adıgüzel, 2018a; Hashmi, Shu and Haider, 2020; Aiolfi, Bellini and Grandi, 2022). As illustrated in Figure 1, further hypothetical is postulated that *hedonic shopping motivation, price discounts, and store atmosphere are predicted to increase impulse buying through shopping enjoyment*.

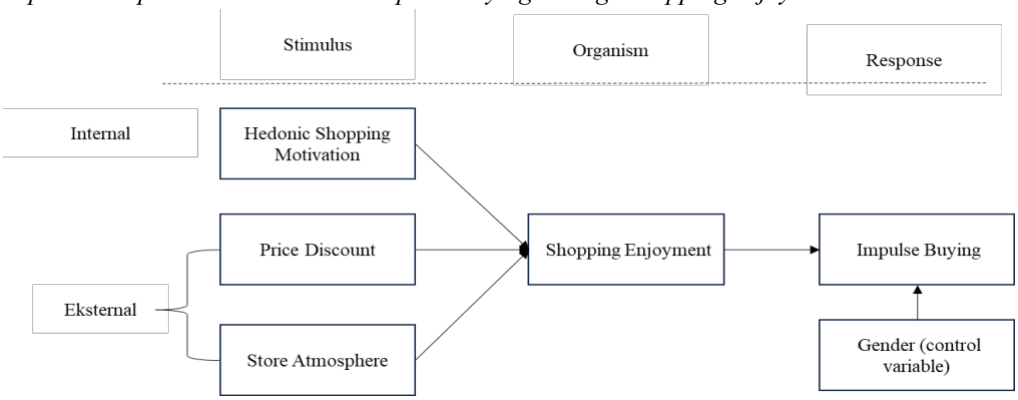

Figure 1: Model Hypothesis

This model includes gender as a control variable, related to research results that show the influence of gender on impulse buying behavior (Atulkar and Kesari, 2018; Bhatia, 2019; Djafarova and Bowes, 2021). Although different things are shown by Büyükdağ et al. (2020), conclude that impulse purchasing behavior does not differ by gender. Gender was incorporated as a control variable in this research, taking into account the general tendency for women to be more susceptible to the influence of fashion products.

2. Method

Research variables, namely Hedonic Shopping Motivation, Price Discount, Store Atmosphere Shopping Enjoyment, and Impulse Buying are latent variables developed based on previous research as listed in the

Appendix Table. Each variable is measured using five constructs. The construct on each latent variable was measured using a five-point Likert scale (1 = "strongly disagree"; 5 = "strongly agree"). Before data collection, face validity is performed on the questionnaire, and a test of the validity and reliability of the construct is carried out. The items of each variable after the validity and reliability tests are expressed in Table 1.

The respondents of this study were students aged 18 to 22 years. Data was collected using a questionnaire in the form of a Google form distributed to 30 WhatsApp group classes at a university in West Java. The respondents of this study are Generation Z, who have purchased fashion products on the e-commerce platform and Instagram social media. Data collection was carried out from August to December 2022. Referring to the research model (Figure 1), the minimum sample size that must be taken is ten times the number of constructs in each variable, which is 250 (Hair et al., 2017). The number of respondents in this study was 444 people. This research model was analyzed using Structural Equation Modelling (SEM). The utilized application is Smart PLS 3.0.

The assessments of the items' reliability and validity are presented in Table 1. All variables have Average Variance Extracted (AVE) values that exceed 0.5. The values of Cronbach's Alpha, Rho A, and Composite Reliability exceed 0.7. According to Hair et al. (2017), it can be concluded that the utilized construct is reliable and valid.

Table 1: Validity and Reliability Test

Variables	**Reliability**			**Validity**
	Cronbach's Alpha	Rho A	Composite Reliability	Average Variance Extracted (AVE)
Hedonic Shopping Motivation	0.898	0.902	0.925	0.713
Price Discount	0.880	0.883	0.913	0.678
Store Atmosphere	0.848	0.852	0.892	0.623
Shopping Enjoyment	0.850	0.851	0.893	0.626
Impulse Buying	0.834	0.838	0.883	0.601

Tests for model fit are detailed in Table 2. The fact that the Standardized Root Mean Square (SRMR) is below 0.08 indicates that this model is compatible with the data. The appropriateness of this model is further validated by the loading factor values, all exceeding 0.7 (Appendix Table). Three exogenous variables can accurately predict shopping enjoyment, as the R2 value of 0.862 indicated. A moderate correlation is observed between impulsive purchasing and shopping enjoyment, with a value of 0.435. Q2 is an additional fit model parameter that indicates the precision of the research model's predictions. The moderate Q2 value is 0.511. Thus, concerning Hair et al. (2019), this model can be utilized to elucidate Generation Z's impulse buying behavior.

Table 2: Model Fit

	Value
SRMR	0,063
R^2 Shopping Enjoyment	0,827
R^2 Impulse Buying	0,437
Q^2	0.511

3. Results

As shown in Table 3, fashion purchases are conducted via e-commerce platforms and Instagram. Instagram and Shopee are two of the most popular e-commerce platforms for fashion purchases. When examined concerning the gender composition of specific e-commerce platforms, the inclinations of males and females concerning fashion retailers are virtually indistinguishable.

Table 3: Distribution of Fashion Purchases by Gender in Online Stores

Online Shop	Shopee	Lazada	Instagram	Tokopedia	Zalora	Total
Female	23,20	3,38	24,10	2,70	1,13	54,50
Male	20,04	2,70	19,82	2,03	0,90	45,50
Total	43,24	6,08	43,92	4,73	2,03	100,00

The statistical analysis presented in Table 4 indicates that the variables of hedonic shopping motivation, price discount, and store atmosphere significantly influence shopping enjoyment, as noted in a p-value less than 0.05. The correlation between shopping enjoyment and impulsive purchasing also exhibits a substantial influence value. Additionally, the statistical analysis displayed in Table 4 suggests that gender does not substantially impact impulse buying.

Table 4: Path Coefficient

	Coefficient	Standard Deviation (STDEV)	T statistics (|O/STDEV|)	P Values
Hedonic Shopping Motivation -> Shopping Enjoyment	0.162	0.051	3.169	0.002
Price Discount -> Shopping Enjoyment	0.360	0.053	6.786	0.000
Store Atmosphere -> Shopping Enjoyment	0.429	0.065	6.629	0.000
Shopping Enjoyment -> Impulse Buying	0.664	0.041	16.269	0.000
Gender (Var Control) -> Impulse Buying	0.042	0.033	1.248	0.213

The indirect effect value of the three exogenous variables on impulse purchases via shopping enjoyment is presented in Table 5. The observed magnitude indicates that Store Atmosphere exerts a more significant influence than the other two variables.

Table 5: Indirect Effect

	Indirect Effect
Hedonic Shopping Motivation -> Shopping Enjoyment-> Impulse Buying	0.108
Price Discount -> Shopping Enjoyment-> Impulse Buying	0.239
Store Atmosphere -> Shopping Enjoyment -> Impulse Buying	0.285

4. Discussion

According to research findings, hedonic shopping motivation significantly impacts shopping enjoyment among Generation Z. This provides further evidence in favor of the proposition that individuals belonging to Generation Z engage in purchasing activities to attain immediate gratification (Djafarova and Bowes, 2021; Munsch, 2021). Generation Z is frequently emotionally invested in the fashion industry due to its propensity to monitor trends and endorse aesthetics. Hedonic motivation can obscure self-control, incite curiosity, and intensify the desire for pleasure in purchasing goods (Chang et al., 2023). When individuals with high hedonic shopping motivation seek emotional satisfaction from their purchases, they are likelier to experience shopping pleasure (Kim et al., 2021). The discovery of a fashionable item one adores will lead to an enhanced shopping experience. Hence, it is probable that Generation Z will derive greater pleasure from the act of shopping when their hedonic desires can be satisfied (Horváth and Adıgüzel, 2018b; Ong et al., 2022).

The impact of price discounts on the enjoyment of shopping is substantial. Generation Z, primarily students in this study, has a limited budget, so they are susceptible to price reductions. They perceive discounts as an immediate incentive to buy fashion (Kim et al., 2007; Zhou et al., 2018). They are content due to the perception that the difference in purchase price has resulted in cost savings (Flavian, Guinaliu and Lu, 2020; Mayhoub and Rabboh, 2022). Price reductions are also regarded as amusing and playful by consumers driven by hedonic motivation (Kwok and Uncles, 2005). This will frequently override the necessity of the product and further incentivize a customer to make a purchase (Venkatesh et al., 2021).

The results of statistical tests show that store atmosphere significantly affects shopping enjoyment (Table 4). Consumers who seek emotional satisfaction in shopping tend to feel greater satisfaction when shopping in an attractive store environment. Practical product layout and placement can stimulate consumers to browse more products (Shoenberger and Kim, 2019; Sharma and Bumb, 2022). In addition, visual displays in online stores increase the sensation of shopping (Krasonikolakis et al., 2018). On Shopee and Instagram, vendors frequently carry out visual displays like live sales. This particular aspect is what attracts a more significant number of participants to this online store. Live online sales often employ the participation of significant others, such as well-known individuals or sellers affiliated with the store in question. This practice aims to create a positive impression and foster a relaxed atmosphere through direct reciprocal exchanges, which may potentially sway customers towards impulsive purchasing decisions (Kim et al., 2021; Li, Wang and Cao, 2022; Lin et al., 2022).

This study's results align with Lee & Chen (2021), who show that consumers tend to impulse buy if they feel happy when interacting with the shopping environment. Generation Z, who grew up with technology and social media, the shopping experience is often associated with entertainment and self-expression. When Generation Z enjoys shopping and feels good, they tend to be more prone to impulse purchases. In addition, the influence of social media content, such as reviews, photos, and videos, can increase shopping enjoyment and trigger impulse buying.

As shown in Table 5, the influence of store atmosphere on impulse buying is more dominant than hedonic motivation and price discounts. This shows that Generation Z still considers what is presented in the store, such as clear product information, display, and accurate navigation, so it is possible to surf precisely and efficiently. The accuracy of product information, clear product display, and easy navigation reflects the quality of the online store (Barnes and Vidgen, 2006). Thus, generation Z does not solely satisfy their hedonic motivations or are tempted by discounts in online shopping; they also consider the store's quality. This shows that Generation Z is a wise buyer.

Gender-related research findings show a non-significant effect on impulse buying. These results are in line with the findings of Büyükdağ et al. (2020). In contrast, Djafarova & Bowes (2021) show that the behavior of men and women differs in buying products on Instagram, where women are more easily influenced than men. This is allegedly related to the findings of this study, which shows Generation Z is more concerned about the quality of stores than satisfying their hedonic motivations. In addition, adolescent male and female consumers have equal levels of hedonic motivation. Still, men find it easier to buy products with consideration of choice and clarity of product information without taking into account other people's opinions or cost savings (Sramova and Pavelka, 2019).

5. Conclusion and Implication

The findings of this study show that Hedonic Shopping Motivation, Price Discounts, and Store Atmosphere can predict impulse buying behavior through Shopping Enjoyment. Hedonic Shopping Motivation, Price Discounts, and Store Atmosphere stimulate the excitement of shopping and further encourage impulse buying. Impulse buying behavior in fashion products does not differ between men and women.

Store atmosphere affects impulse buying more than the other two variables. This finding is essential for marketers to maintain their online store environment so that consumers feel comfortable, including easy page navigation, accurate information, and quality image display. Meanwhile, hedonic motivation is the weakest antecedent in influencing impulse buying. This is an illustration that strengthens the fact that the most significant factor for students to do impulse buying is not hedonic motivation, which may be influenced by income or the amount of money they have.

Another thing that can be input for business people is setting the right price promotion strategy. Flash sales on specific dates will encourage impulse buying because consumers are limited to a narrow time, so they cannot consider well whether the product offered is what is needed. On the other hand, business people are still responsible

for educating their consumers to be wise in buying products. One form of education that can be provided is, for example, providing honest and accurate information about a product.

This research has not specifically determined the products that are the object of impulse buying carried out by participants. This may show different results from previous studies, where gender did not significantly influence impulse buying. This point is important to note, considering that in online purchases, (1) the object of purchase that is the favorite of men and women is usually different in general ((Pascual-Miguel, Agudo-Peregrina and Chaparro-Peláez, 2015) et al., 2015), (2) women are more easily influenced by peers in buying online products (Garbarino and Strahilevitz, 2004) (3) men and women have quite different perceptions in the process of deepening the introduction of product details (Lin et al., 2019; Yi, 2022).

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Bank Risk-Taking and Monetary Policy: Empirical Results for Taiwan

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Abstract
Will bank risk-taking increase in response to monetary policy easing, especially when interest rates are low, and will banks increase their risk-taking in pursuit of profits? Using Z-score and non-performing loan ratio of Taiwan banking sector covered the period 2015-2020 as proxy variables for bank risk, the empirical analysis shows that there is no significant evidence to support bank risk-taking behavior in a loose monetary policy environment, implying the risk-taking channel of monetary policy not existing. However, after considering the impact of Basel III on bank capital regulations in Taiwan since 2013, bank risk-taking will increase with monetary policy easing as capital regulations become more stringent, which is consistent with the regulatory hypothesis. As for the impact of monetary regime change, banks' risk will increase with loosening monetary policy during the easing phase of monetary policy, while during monetary policy tightening stage, banks have no risk risking tendency. These inferences are valid after taking the effect of the 2008 financial crisis and considering the cross-effects of bank characteristics and monetary policy, indicating that not only banks' risk-taking is related to the strengthening of bank capital regulations, but the difference in the regime of monetary easing and tightening also affects bank risk-taking behavior.

Keywords: Bank Risk-Taking, Monetary Policy, Risk-Taking Channel

1. Introduction

The undue risk-taking behavior of banks is considered one of the causes of the 2008 global financial crisis. Therefore, discussing the relationship between monetary policy and bank risk-taking, analyzing whether monetary policy affects bank risk-taking, whether bank risk-taking acts as a transmission mechanism for monetary policy effects, and whether financial stability is negatively affected by loose monetary policy are among the topics discussed in recent literature.

For central banks, adjusting interest rates to respond to economic downturns is a common policy measure. However, past analyses of the effects of monetary policy have tended to overlook the relationship between bank risk-taking and loose monetary policy. One reason for this, according to the literature, is that central banks' macroeconomic policy objectives have shifted from controlling inflation to promoting economic growth. Additionally, financial innovation has allowed risks to be more effectively diversified, thereby increasing the flexibility of the financial system to adapt to market changes. Based on these perspectives, the issue of whether monetary policy affect financial stability has been less discussed. However, for banks, during periods of loose monetary policy, the drive to achieve expected profit targets may lead them to engage in higher-risk investment behavior. Furthermore, a prolonged environment of low interest rates may reduce banks' perception of risk in investment decisions, leading to an underestimation of actual risk levels. Therefore, while loose monetary policy cannot be solely blamed for the financial crisis, it could indeed be one of the causes. This is because in a persistently low-interest-rate environment, it can affect and reduce banks' and investors' perception of risk, potentially leading to financial imbalances.

The literature describes the mechanism through which monetary policy affects financial institutions' risk perception or risk tolerance as the "risk-taking channel." Why does bank risk-taking increase with low interest rates or loose monetary policy? Rajan (2005) argues that low-interest rates reduce banks' short-term funding costs and decrease their returns from financial assets like bonds, incentivizing financial institutions to increase their risk exposure in pursuit of higher yields. Adrian and Shin (2010) point out that low-interest rates influence banks' balance sheet structures, encouraging them to rely more on short-term funding, and to lend to riskier borrowers. Borio and Zhu (2012) suggest that loose monetary policy increases the value of assets on banks' balance sheets, leading them to adjust their expectations of default probabilities, losses from defaults, and price volatility, thereby affecting their assessment of expected risks. Consequently, as financial asset prices rise due to low-interest rates, banks' risk tolerance increases, leading to an expansion in lending or credit provision. Additionally, in a persistently low-interest-rate environment, the predictability of future policy directions increases, reducing market uncertainty through communication policies of central banks, thus enhancing banks' willingness to take on risk.

Empirical evidence suggests that a low-interest-rate environment does increase banks' expected default rates for corporate loans (Gaggl and Valderrama, 2010), leading banks to relax lending conditions (Jiménez et al., 2014) and engage in riskier lending activities (Altunbas et al., 2014). Additionally, factors such as pessimism about economic prospects (Montes and Scarpari, 2015), increased competition among banks (Ha and Quyen, 2018), and the rise of internet finance (Qiao et al., 2018) also contribute to increased bank risk-taking. Characteristics such as bank size, liquidity, and capitalization affect risk-taking behavior inversely; larger, more liquid, and better-capitalized banks tend to take on less risk (Özşuca and Akbostancı, 2016). Changes in banking regulation and monetary policy frameworks also influence bank risk-taking behavior. Stricter capital controls have been associated with increased bank risk-taking (Mujtaba et al., 2022, Dias, 2021), while differences in loose or tight monetary policy regimes affect bank risk-taking differently (Djatche, 2019).

In a low-interest-rate environment, influenced by factors such as banks' pursuit of profits, adjustments to risk perceptions, and decreased market uncertainty, do Taiwanese banks increase their risk tolerance and face higher risks? Does the bank risk-taking channel exist in the transmission process of Taiwan's monetary policy effects? This study focuses on Taiwanese domestic banks from 2006 to 2020, discussing whether bank risk-taking increases with declining interest rates and analyzing whether the strengthening of bank capital regulations and differences in monetary policy regimes affect bank risk-taking. The empirical evidence presented in the study suggests that, without considering the impact of Basel III capital controls and differences in monetary policy regimes, there is no clear and substantial evidence supporting the idea that bank risk increases with loose monetary policy, indicating the absence of a monetary policy bank risk-taking channel. However, after considering the impact of Basel III capital controls implemented in Taiwan in 2013, the evidence shows that bank risk increases with loose monetary policy, supporting the regulatory hypothesis. This conclusion holds true regardless of whether bank risk is represented by Z-scores or non-performing loan ratios. The analysis also demonstrates that bank risk-taking behavior varies with different monetary policy regimes. The empirical analysis indicates that bank risk-taking occurs during loose monetary policy phases, while banks show no risk-taking tendencies during tight monetary policy regimes. Even after considering the impact of the 2008 financial crisis and the interaction effects of bank

characteristics and monetary policy, these conclusions remain valid. This suggests that bank risk-taking is influenced not only by the strengthening of bank capital regulations but also by differences in loose or tight monetary policy regimes.

Apart from the introduction, the second section of this paper discusses and reviews the literature, the third section introduces the research methodology, the fourth section explains the data and analyzes the empirical results, and finally, the conclusion is presented.

2. Literature review

Empirical research on bank risk-taking, Gaggl and Valderrama (2010), using Austrian bank lending data, analyzed that during the period of low interest rates from 2003 to 2005, there was an increase in expected default rates for corporate loans. Jiménez et al. (2014) analyzed Spanish banks from 1984 to 2006 and indicated that low interest rates environment reduce the default probability of existing loans and make banks reduce lending conditions and engage in riskier loans, expanding their lending to borrowers with poorer credit and higher risk.

Altunbas et al. (2014) discussed the impact of loose monetary policy on EU and US bank risks using individual bank expected default frequency from the KMV credit risk model. After controlling the effects of macroeconomic factors and bank characteristics, Altunbas et al. (2014) pointed out that a persistently low-interest rate environment increases bank risk. Therefore, from a financial stability perspective, monetary policy is not neutral.

Montes and Scarpari (2015) discussed whether central bank policy communication affects bank risk-taking. Analysis using Brazilian data showed that bank provisions increase with pessimistic views of future economic conditions by monetary authorities and decrease with policy rate cuts. This demonstrates that perceptions of future interest rates and the overall economic situation released through monetary policy affect bank strategies and risk-taking.

Ha and Quyen (2018) analyzed Vietnamese commercial banks from 2007 to 2016, using Z-scores to represent bank risk, and showed that bank risk-taking increases with loose monetary policy. Additionally, Ha and Quyen (2018) noted that bank risk-taking is also related to market power, with banks having more market power exhibiting lower risk-taking tendencies, indicating that bank risk-taking increases with market competition. Qiao et al. (2018) discussed the impact of internet finance on risk-taking in the Chinese banking industry using Z-scores and non-performing loan ratios as bank risk. Empirical evidence showed that bank risk-taking increases not only with loose monetary policy but also with the rise of internet finance, reinforcing the role of loose monetary policy in bank risk-taking.

Özşuca and Akbostancı (2016) demonstrated the impact of monetary policy changes on bank risk in Turkey from 2002 to 2012 using the deviation of policy rate from benchmark rate as monetary policy changes. Empirical results indicated that bank risk-taking increases with policy rates below the benchmark level. Regarding bank characteristics, risk-taking tends to be lower for larger, more liquid, and better-capitalized banks.

Paligorova and Santos (2017) discussed the existence of channels for bank risk-taking in corporate loans pricing in the United States. Empirical evidence showed that during loose monetary policy phases, for risk appetite banks, the risk premium for risky corporate loans is lower than the one in tight monetary policy phases, indicating that monetary policy affects bank risk-taking through these channels.

Furthermore, literature suggests that bank risk-taking is influenced by changes in bank capital regulation and shifts between loose and tight monetary policy regimes. Regarding the impact of bank capital regulation, literature indicates that the effect of increasing capital requirements on reducing bank risk is a controversial issue. On one hand, due to deposit insurance protection, banks may engage excessively in risky activities at the expense of depositors to maximize shareholder value. To prevent such moral hazard issues, Kim and Santomero (1988) suggest increasing capital requirements proportionally to the increasing risk undertaken by banks to internalize bank losses. The 'too big to fail' perspective also suggests a similar phenomenon, where government bailouts serve

as a backstop, leading systemic banks to engage in excessive risk-taking behavior. Therefore, the regulatory hypothesis suggests that capital requirements should increase with the rising risk undertaken by banks, implying a positive relationship between capital requirements and bank risk. However, on the other hand, Anginer and Demirgüç-Kunt (2014) argue that increasing capital requirements can strengthen banks' ability to cope with unexpected adverse economic shocks, meet depositors' withdrawal demands, and allow bank owners to make investment choices more prudently. Therefore, stricter capital requirements can reduce banks' vulnerability, thus mitigating moral hazard issues caused by deposit insurance. Thus, policies that make banks have skin in the game through increased capital can enhance banks' risk monitoring and scrutiny attitudes, thereby reducing bank risk, indicating an inverse relationship between increased capital regulation and bank risk. Although the latter is conventional view, after the 2008 global financial crisis, there has been literature supporting the notion that capital regulation may increase bank risk-taking. Some literature even criticizes Basel II for insufficient risk-based capital requirements, leading to an inability to curb bank risk-taking. With the introduction of Basel III in 2010, which imposes risk-based capital regulations on banks, the main aim is to reduce incentives for bank risk-taking to enhance banking stability, but it also subjects banks to stricter capital regulations.

Related empirical studies like Mujtaba et al. (2022) and Dias (2021) indicate that increasing or tightening capital regulations lead to increased bank risk-taking. Mujtaba et al. (2022) analyzed Asian emerging markets from 2004 to 2017 using non-performing loan ratios and loan loss reserve ratios to represent bank risk. Their analysis showed a positive relationship between bank risk-taking and the ratio of own capital, supporting the regulatory hypothesis. Based on Calem and Rob (1999) models analyzing the effect of capital regulations on bank risk-taking, Dias (2021), covering over 1800 banks in more than 135 countries globally from 2011 to 2015, showed that the Z-score exhibits an inverted U-shaped relationship with increasing capital regulation, indicating a non-linear interaction between bank risk and capital regulation. Furthermore, Dias (2021) noted that stricter regulations weaken the effectiveness of reducing bank risk-taking through increased capital and risk-based capital requirements, whether for well-capitalized or undercapitalized banks, induce bank risk-taking at higher capital ratios.

Regarding the association between bank risk-taking and monetary policy regimes, Djatche (2019) pointed out that while studies suggest a low-interest-rate environment encourages bank risk-taking behavior, there are also studies indicating that low-interest rates are beneficial to banks and do not increase bank risk (Kane, 1989; Smith, 2002; Agur and Demertzis, 2012; Korinek and Simsek, 2016; Brummermeier and Koby, 2016). Therefore, Djatche (2019) believes that the impact of loose monetary policy on bank risk varies with different monetary policy regimes. Using Z-scores to represent bank risk and the deviation of policy rate from Taylor rule rate(Taylor gap) as a threshold variable, Djatche (2019) conducted empirical analysis on US banking data using the Hansen (1999) threshold model, showing that the impact of loose monetary policy on bank risk changes with different monetary policy regimes. When the Taylor gap is below the threshold, due to the relatively low market rates, the pursuit of profitable investments makes risky investments more attractive, thus loose monetary policy increases bank risk-taking. This aligns with Rajan (2005)'s view that banks pursue higher returns. Conversely, when the Taylor gap is above the threshold, loose monetary policy favors banking stability because rate cuts reduce bank costs.

3. Methodology

Whether the bank risk taking channel exists, as set forth by Altunbas et al. (2014), can be tested by following equation :

$$Risk_{i,t} = \alpha_0 + \alpha_1 Risk_{i,t-1} + \beta M_t + \lambda Size_{i,t} + \rho Cap_{i,t} + \delta Liq_{i,t} + \upsilon y_t + \omega \pi_t + \xi ex_t + \varepsilon_{i,t} \quad (1)$$

where $Risk_{i,t}$ is the risk level of a bank, i is bank and t is time, and $\varepsilon_{i,t}$ is the independently and identical distributed error term. M_t stands for changes in monetary policy. $Size_{i,t}$、$Cap_{i,}$ and $Liq_{i,t}$ represent the bank specific characteristics such as size, capitalization and liquidity, respectively. And y_t , π_t and ex_t are the major macroeconomic variables such as economic growth rate, inflation rate and exchange rate changes, for controlling the effects of economic environment on bank risks.

We use both the Z-score and nonperforming-loan ratio of the bank to represent the risk level of bank. The justification for using Z-score is to highlight the relationship between a bank's capital and the volatility of its returns, which reflects how much variability in returns could be absorbed by a bank's capital without putting the bank into insolvency. Z-score is the natural logarithm of the index which is calculated by the following equation:

$$Z_{it} = \frac{ROA_{it} + \frac{E_{it}}{A_{it}}}{\sigma(ROA_i)} \tag{2}$$

where ROA_{it} is the return on assets of bank, calculated by after-tax profit on eh total assets. E_{it} and A_{it} are the bank equity and total assets of the bank, respectively. $\sigma(ROA_i)$ is the standard deviation of the return on assets of bank. According to equation (2), Z-score rises as the increase in ROA_{it} and E_{it}, or decrease in $\sigma(ROA_i)$, therefore the bank risk will increase as Z-score falls. The nonperforming loan ratio is equal to the amount of nonperforming loans divided by the total number of loans, used to indicate the potential adverse impact of deteriorating loan quality on bank profitability and market value. The nonperforming loan ratio represents the loan portfolio risk or credit risk faced by banks. An increase in the nonperforming loan ratio indicates higher credit risk faced by banks, thus bank risk rises as the nonperforming loan ratio increases. [1]

This study uses the interbank overnight lending rate as the proxy of monetary policy. Regarding the demonstration of monetary policy changes, changes in interest rates (Djatche, 2019; Sarkar and Sensarma, 2019) or the gap between policy rates and the natural interest rate (Altunbas et al., 2014; Özşuca and Akbostancı, 2016) are utilized. Therefore, the research process will analyze these two settings separately to explore the similarities and differences in the results obtained.

About the three bank-specific characteristics, size, capitalization and liquidity, we use two approaches to get these variables. The first approach (referred to as "C1" in the text), following Ehrmann et al. (2003) and Gambacorta (2005), we define the bank characteristic variables as:

$$\begin{aligned} Size_{i,t} &= \log A_{i,t} - \frac{1}{N_t}\sum_i \log A_{i,t} \\ Cap_{i,t} &= \frac{C_{i,t}}{A_{i,t}} - \frac{1}{T}\sum_t \left(\frac{1}{N_t}\sum_i \frac{C_{i,t}}{A_{i,t}}\right) \\ Liq_{i,t} &= \frac{L_{i,t}}{A_{i,t}} - \frac{1}{T}\sum_t \left(\frac{1}{N_t}\sum_i \frac{L_{i,t}}{A_{i,t}}\right) \end{aligned} \tag{3}$$

where size is measured by the log of total assets, $A_{i,t}$. Liquidity is defined as the ratio of liquid assets $L_{i,t}$ (cash, interbank lending and securities) to total assets, and capitalization is given by the ratio of equity, C_{it}, to total assets. As seen, all three bank characteristics are normalized with respect to their average across all the banks in a given sample. To eliminate trend in size, the sample is normalized not only over the whole period but also over each single period (Ehrmann et al., 2003). The second approach ("C2") refers to the specification outlined by Dang and Dang (2020), where bank size is equal to the natural logarithm of total assets, capitalization level is calculated by dividing bank equity by total assets, and liquidity is defined as liquid assets divided by total assets. Since these bank characteristic variables may impact the risk of banks, higher levels of capitalization tend to reduce bank risk, while lower liquidity may increase the probability of bank failure. Moreover, larger bank size can provide protection against risks on one hand, but on the other hand, it may become too big to fail, thus increasing the risk the bank undertakes. Therefore, in the analytical process, bank characteristics such as capitalization, liquidity, and size are included in the regression equation to control for the influence of these factors on bank risk (Brana et al., 2019).

[1] Since Z-score is an inverse measure of bank risk, i.e., higher the value of Z-score lower the risk, we expect the opposite sign on the estimated coefficients when the Z-score replaces the nonperforming loan ratio as the dependent variable.

To further investigate whether the effects of bank characteristic variables on bank risk are affected by loose monetary policy and hence bank risk taking channel monetary transmission channel might be altered by bank characteristics, we add the interaction terms between each bank characteristic variable and monetary policy into equation (1):

$$\begin{aligned} Risk_{i,t} = {} & \alpha_0 + \alpha_1 Risk_{i,t-1} + \beta M_t + \lambda Size_{i,t} + \rho Cap_{i,t} + \delta Liq_{i,t} \\ & + \sigma M_t Size_{i,t} + \tau M_t Cap_{i,t} + \varsigma M_t Liq_{i,t} + \upsilon y_t + \omega \pi_t + \xi ex_t + \varepsilon_{i,t} \end{aligned} \tag{4}$$

According to equation (4), when the estimates of the interaction terms between the bank characteristic variables and monetary policy are positive and statistically significant, it implies that the role of banks in transmitting monetary policy through risk-taking is strengthened as capitalization level, liquidity, and size of banks increase.

Furthermore, considering potential changes in bank risk-taking due to alterations in banking capital regulations (Mujtaba et al., 2022; Dias, 2021) and differences in the phase of monetary policy easing or tightening (Djatche, 2019), these factors are also incorporated into the analytical framework. Concerning banking capital regulations, since the Taiwan Financial Supervisory Commission mandated banks to adhere to Basel III standards in 2013, thereby increasing bank capital, to account for the possible impact of these capital control regulations on bank risk, equation (1) can be rewritten as equation (5):

$$\begin{aligned} Risk_{i,t} = {} & \alpha_0 + \alpha_1 Risk_{i,t-1} + (\beta_1 + \beta_2 * \text{dummy}_{\text{Basel III}}) M_t \\ & + \lambda Size_{i,t} + \rho Cap_{i,t} + \delta Liq_{i,t} + \upsilon y_t + \omega \pi_t + \xi ex_t + \varepsilon_{i,t} \end{aligned} \tag{5}$$

where $\text{dummy}_{\text{Basel III}}$ represents a dummy variable indicating whether Basel III regulations are in effect, with value 0 before 2012 and 1 after 2013. Based on the specification of equation (5), the impact of monetary policy changes on bank risk is determined by the signs of β_1 and β_2. When the non-performing loan ratio reflects bank risk and banks engage in risk-taking behavior that increases with stricter Basel III capital regulations, the sign of β_2 should be negative, while the sum of β_1 and β_2 is less than zero. Alternatively, when using Z-scores to indicate the level of bank risk, the sign of β_2 should be positive, while the sum of β_1 and β_2 is greater than zero. If further considering the potential impact of interactions between bank characteristic variables and monetary policy on bank risk-taking, equation (5) can be rewritten as:

$$\begin{aligned} Risk_{i,t} = {} & \alpha_0 + \alpha_1 Risk_{i,t-1} + (\beta_1 + \beta_2 * \text{dummy}_{\text{Basel III}}) M_t + \lambda Size_{i,t} + \rho Cap_{i,t} + \delta Liq_{i,t} \\ & + (\sigma_1 + \sigma_2 * \text{dummy}_{\text{Basel III}}) M_t Size_{i,t} + (\tau_1 + \tau_2 * \text{dummy}_{\text{Basel III}}) M_t Cap_{i,t} \\ & + (\varsigma_1 + \varsigma_2 * \text{dummy}_{\text{Basel III}}) M_t Liq_{i,t} + \upsilon y_t + \omega \pi_t + \xi ex_t + \varepsilon_{i,t} \end{aligned} \tag{6}$$

Regarding the impact of changes in monetary policy regimes on bank risk, Djatche (2019) and Brana et al. (2019) have noted that the relationship between bank risk-taking and monetary policy changes varies depending on the state of monetary policy. To account for this, the research process employs the deviation of policy rate from the natural rate (q_t) to represent different phases of monetary policy. When this deviation is greater than zero or less than zero, it indicates that monetary policy is in a tightening or easing state, respectively. Therefore, the phenomenon of bank risk-taking varying with different states of monetary policy can be presented by reformulating equation (1) into equation (7):

$$\begin{aligned} Risk_{i,t} = {} & \alpha_0 + \alpha_1 Risk_{i,t-1} + \beta_1 M_t \mathrm{I}(q_t \le 0) + \beta_2 M_t \mathrm{I}(q_t > 0) \\ & + \lambda Size_{i,t} + \rho Cap_{i,t} + \delta Liq_{i,t} + \upsilon y_t + \omega \pi_t + \xi ex_t + \varepsilon_{i,t} \end{aligned} \tag{7}$$

where q_t represents the threshold variable indicating the state of monetary policy, and $\mathrm{I}(.)$ is the indicator function. β_1 and β_2 denote the effects of monetary policy easing or tightening intervals on the impact of monetary policy changes on bank risk. When using the non-performing loan ratio to indicate bank risk, if the

phenomenon of increased bank risk-taking due to monetary easing only occurs during periods of loose monetary policy, then the signs of β_1 and β_2 should respectively be negative and positive. Conversely, when using Z-scores to indicate bank risk, the signs of β_1 and β_2 should respectively be positive and negative.

4. Results

Due to the interest rate hikes initiated by the United States since 2022, global interest rates have risen. Therefore, this study takes the longitudinal and cross-sectional data of 33 domestic banks in Taiwan from 2006 to 2020 as the analytical objects to discuss whether loose monetary policy in a low-interest-rate environment will increase bank risk and whether banks exhibit risk-taking behavior. The data necessary for calculating bank characteristics and bank risk are collected from the Statistical Database Query System of the Banking Bureau of the Financial Supervisory Commission.

Regarding the calculation of equation (3) for bank characteristic variables, total assets are derived from the balance sheet of domestic banks (asset-liability balance sheet), liquid assets are represented by cash and cash equivalents on the balance sheet, including deposits with central banks and interbank borrowings, which are combined as substitute variables, and bank equity is obtained from the equity item on the balance sheet. The calculation of the Z-score indicating bank risk, according to the content of equation (2), involves the asset return rate, which is net profit divided by total assets, with net profit data obtained from the pre-tax earnings item on the income statement of financial institutions, and total assets and bank equity are sourced separately from the asset and equity items on the balance sheet. The calculation of the standard deviation of asset return rates adopts a rolling method referenced from literature, calculating the standard deviation every three years, and then computing the Z-score based on the corresponding asset return rate and equity ratio. As for the data on the non-performing loan ratio, it is directly obtained from the Banking Bureau's statistical database.

The main macroeconomic variables include economic growth, inflation, and exchange rate fluctuations. Economic growth data is sourced from the Directorate-General of Budget, Accounting and Statistics, which publishes economic growth rate data. Inflation is represented by the annual growth rate of the Consumer Price Index, and exchange rate fluctuations are based on the movement of the New Taiwan Dollar against the US Dollar. These data are obtained respectively from the databases of the Directorate-General of Budget, Accounting and Statistics and the Central Bank of Taiwan.

As the proxy variables for monetary policy, the overnight interbank lending rate is used, and both the policy rate deviation from the natural rate and the changes in the lending rate represent the variables of monetary policy changes in the study. The natural interest rate will be estimated using the HP filter method.

Finally, regarding the estimation of the relationship between monetary policy changes and bank risk-taking, such as equations (1), (4) to (7), the endogeneity issues arise due to the dependent variables being related to their lagged values and the use of panel data of banks, which may face endogeneity issues such as the bank asset size expanding with loan growth and changes in the capitalization level accompanying changes in bank size. This could lead to biased estimation results.

To address this concern, the study employs the Generalized Method of Moments (GMM) system estimator proposed by Arellano and Bover (1995) and Blundell and Bond (1998), obtaining results through a two-step estimation process. When the selected instrumental variables are appropriate and the residuals exhibit no second-order serial correlation, the estimates will possess properties of consistency and efficiency. Regarding the selection of instrumental variables, lagged values of the dependent and explanatory variables are chosen. The study utilizes the Hansen over-identification test to examine whether the selected instrumental variables are correlated with the error term, verifying the appropriateness of the chosen instrumental variables.

4.1 Bank risk-taking analysis

Table 1 presents the results of estimating equation (1) using different bank characteristics calculation methods (C1 and C2), with bank risk represented by Z-scores and non-performing loan ratios(NPL), and different monetary policy variables (interest rate gap("M1") and interest rate changes("M2")). In the upper panel of Table 1, where Z-scores represent bank risk and the interest rate gap represents monetary policy changes, the estimated coefficients of β are positive for both C1 and C2. This indicates that Z-scores decrease with loose monetary policy, suggesting that bank risk increases with loose monetary policy, indicating a risk-taking behavior by banks. However, the estimated coefficient of β is statistically significant only at the 10% level for C1 and not significant for C2. When interest rate changes represent monetary policy changes, regardless of C1 or C2, the estimated coefficients of β are negative. This suggests that bank risk does not increase with loose monetary policy, indicating that banks do not exhibit a risk-taking tendency.

If bank risk is represented by non-performing loan ratios, as shown in the lower panel of Table 1, the estimated coefficients of β are positive and statistically significant regardless of the monetary policy variables and the method of calculating bank characteristics. This indicates that non-performing loan ratios do not increase with loose monetary policy, suggesting that banks do not engage in risk-taking behavior.

Regarding the impact of macroeconomic variables on bank risk, the effect of inflation on Z-scores and non-performing loan ratios is positive and negative, respectively, indicating that rising inflation is beneficial for reducing bank risk. The Hansen test and the second-order autocorrelation test for residuals for all estimation results show p-values greater than the 10% level, indicating the appropriateness of instrumental variable selection and the suitability of the estimation results.

In summary, based on the estimation results of equation (1), only when Z-scores represent bank risk and the interest rate gap represents monetary policy changes, along with bank characteristics calculated using C1, supports the conclusion that bank risk increases with loose monetary policy, suggesting a risk-taking behavior by banks. Other results either lack statistical significance or do not align with the expectations of banks exhibiting risk-taking behavior. Overall, the estimation of the impact of monetary policy changes on bank risk in equation (1) does not provide clear evidence to support the inference of banks engaging in risk-taking behavior.

In the research process, the impact of the 2008 global financial crisis is further considered by incorporating a dummy variable to represent the effect of the financial crisis. This dummy variable is included in equation (1) as an explanatory variable for estimation. Regarding the setting of the financial crisis dummy variable, the years 2008 and 2009 are considered as the stages affected by the financial crisis. Therefore, the dummy variable takes the value of 1 for these years and 0 for the remaining years. The estimation results are presented in Table 2.

Similar to the results in Table 1, only in the combination of Z-scores, interest rate gap, and C1, the estimated coefficient of β is significant and positive, supporting the notion that banks exhibit risk-taking behavior. The estimation results for other combinations using either Z-scores or non-performing loan ratios as explanatory variables do not support the hypothesis that bank risk-taking behavior increases with loose monetary policy.

Additionally, considering the interaction between bank characteristics and monetary policy on bank risk, as described in equation (4), the estimation results are presented in Table 3. Again, similar to the results in Table 1, only in the combination of Z-scores, interest rate gap, and C1, there is support for banks exhibiting risk-taking behavior.

In summary, regardless of considering the financial crisis or the interaction between bank characteristics and monetary policy on bank risk, all estimation results from Tables 1 to 3 only indicate banks exhibiting risk-taking behavior in the combination of Z-scores, interest rate gap, and C1. Thus, the support for the inference of banks exhibiting risk-taking behavior is not evident.

4.2 Capital Regulation, monetary policy regime and bank risk-taking

Might the oversight of changes in capital controls and variations in monetary policy intervals in equation (1) be why the empirical results do not support the hypothesis that banks do not possess risk-taking behavior? To delve deeper into this, the analytical approach is refined using equations (5) and (7) to explore the effects of changes in capital controls and differences in monetary policy regimes on bank risk-taking behavior.

In the analysis process using equation (5), a dummy variable is set to differentiate the impact of changes in capital control regulations by the Financial Supervisory Commission before and after 2013. The estimation results are shown in Table 4. According to the content of the table, before the implementation of Basel III, the results using Z-scores and non-performing loan ratios as the dependent variables indicate that the estimated coefficients of β_1 are negative and positive, respectively. This suggests that bank risk does not increase with loose monetary policy, indicating that banks do not exhibit risk-taking behavior. However, after the implementation of Basel III capital controls in 2013, the estimated coefficients of β_2 for Z-scores and non-performing loan ratios change to positive and negative, respectively. Further, when β_1 and β_2 are summed, the results for Z-scores and non-performing loan ratios are positive and negative, respectively. This indicates that after the implementation of Basel III capital control regulations, bank risk increases with loose monetary policy, suggesting that banks exhibit risk-taking behavior, implying that strengthened capital controls lead to increased bank risk, consistent with the regulatory hypothesis.

Furthermore, incorporating the effects of the global financial crisis and the interaction between bank characteristics and monetary policy into equation (5), the relevant estimation results are shown in Tables 5 and 6. The content of these two tables consistently indicates that when Z-scores represent bank risk, the estimated coefficients of β_1 and β_2 are negative and positive, respectively, in the upper half of the table. The former is partially statistically significant, while the latter is all statistically significant. Additionally, the sum of β_1 and β_2 is greater than zero, indicating that banks exhibit risk-taking behavior. Similarly, in the lower half of the tables, when bank risk is represented by non-performing loan ratios, the estimated coefficients of β_1 and β_2 are positive and negative, respectively, with both statistically significant, and the sum of β_1 and β_2 is less than zero. These results all support the hypothesis that banks exhibit risk-taking behavior.

Based on the content of Tables 4 to 6, regardless of whether considering the impact of financial crises and the interaction between bank characteristics and monetary policy, and whether using Z-scores or the loan-to-default ratio to represent bank risk, the estimates consistently indicate that bank risk does not increase with loose monetary policy before the implementation of Basel III. However, after the implementation of Basel III, bank risk increases with loose monetary policy. This implies that with the strengthening of bank capital regulation under Basel III, it changes banks' willingness to bear risk, leading to a positive relationship between bank risk and loose monetary policy. This finding is consistent with the regulatory hypothesis.

Regarding the impact of the difference between monetary policy regimes (loose or tight) on bank risk, the study utilizes the specification of equation (7) to examine the effects. The results of adopting the deviation of policy interest rates from the natural interest rate gap (q_t) to represent changes in monetary policy phases are presented in Table 7. The upper part of the table, with Z-scores as the dependent variable, indicates that when using the interest rate gap to represent changes in monetary policy, the signs of the estimates β_1 and β_2 are positive and negative, respectively. This shows that during periods of loose monetary policy, Z-scores decrease with loose monetary policy, indicating increased bank risk due to loose monetary policy, suggesting banks exhibit risk-taking behavior. However, the estimates are statistically significant under C1 but not under C2. When monetary policy is in a tightening phase, there is an inverse relationship between Z-scores and monetary policy, indicating that bank risk does not increase with loose monetary policy, suggesting banks do not exhibit risk-taking behavior. Results

using interest rate changes as a proxy for monetary policy show that β_1 are negative regardless of the calculation method for bank characteristics, while β_2 is negative under C1 and positive under C2. This suggests that during periods of loose monetary policy, bank risk does not increase with loose monetary policy, indicating banks do not exhibit risk-taking behavior. As the estimate β_2 is positive under C2, it suggests that bank risk increases with loose monetary policy, and risk-taking behavior occurs during periods of monetary policy tightening. Results using the loan-to-default ratio to represent bank risk, as listed in the lower part of Table 7, show that when using the interest rate gap as a proxy for monetary policy changes, the signs of β_1 and β_2 are negative and positive, respectively, and both are statistically significant. This indicates that the phenomenon of increased bank risk with loose policy only occurs during periods of loose monetary policy; during periods of monetary policy tightening, banks do not exhibit risk-taking behavior. Results using interest rate changes as a proxy for monetary policy show that the signs of and are both positive, with only the latter being statistically significant. This indicates that bank risk does not increase with loose monetary policy regardless of the monetary policy regime, suggesting banks do not exhibit risk-taking behavior.

To verify the robustness of the inference from Table 7, the analysis further incorporates the impact of financial crises and the interaction between bank characteristics and monetary policy into equation (7). The relevant estimation results are presented in Tables 8 and 9. The content of Table 8 indicates that when using the interest rate gap as the variable representing monetary policy changes the signs of β_1 and β_2 in the upper panel are positive and negative, these estimates are negative and positive in lower panel of respectively, and all estimates are statistically significant. This implies that regardless proxy of bank risk, the phenomenon of bank risk increasing with loose monetary policy only occurs during the loose monetary policy reimge, and this phenomenon does not hold during the monetary policy tightening phase. When using interest rate changes as a proxy for the monetary policy variable, the signs of β_1 and β_2 in the upper panel are mostly negative, while in the lower panel, they are all positive. Additionally, only under Z-scores with C2, the sign of is positive, supporting the phenomenon of bank risk increasing with loose monetary policy. Similarly, the content of Table 9 shows that when using the interest rate gap to represent monetary policy changes, the signs of β_1 and β_2 are consistent with those shown Table 8. This indicates that the inference where bank risk increases with loose monetary policy can be sustained. However, the results using interest rate changes as a proxy for the monetary policy variable cannot support this inference.

Summarizing the findings from Tables 7 to 9, using positive or negative interest rate gap to demonstrate monetary policy tightening or loosening and regardless the proxy of bank risk, the estimates by adopting the interest rate gap as a measure for monetary policy changes consistently indicate that bank risk tends to rise only during periods of loose monetary policy. This suggests that banks exhibit the tendency for risk-taking behavior when monetary policy is easing. However, there's insufficient evidence to support the idea that bank risk increases with loose monetary policy during periods of monetary policy tightening. The results consistently reveal that bank risk-taking behavior varies with different monetary policy phases, aligning with the assertion that banks tend to take on more risk when monetary policy is loose, as suggested by Djatche (2019). This underscores the notion that in a low-interest-rate environment, banks may pursue higher returns, as highlighted by Rajan (2005). Nevertheless, when using interest rate changes as indicators of monetary policy changes, the evidence supporting the idea of increased bank risk during loose monetary policy periods is not conclusive. Only in the case of Z-scores with C2 in Tables 7 and 8 does it suggest that banks exhibit risk-taking behavior during periods of monetary policy tightening. The inference drawn from the remaining results contradicts this notion.

5. Conclusion

This study investigates whether banks tend to increase their risk-taking behavior with loose monetary policy, particularly in a low-interest-rate environment. Using panel data from 2006 to 2020 of the Taiwan banking sector before the global interest rate trend reversal in 2022, the analysis employs the GMM method of Arellano and Bover (1995) and Blundell and Bond (1998) to conduct empirical analysis.

The study employs Z-scores and the non-performing loan ratio to represent bank risk, while using the interest rate gap and interest rate changes to indicate the changes in monetary policy. The empirical findings suggest that without considering the impact of Basel III capital regulations and differences in monetary policy regimes, most estimates do not support the notion of banks exhibiting risk-taking behavior, and there's no sufficient evidence indicating that bank risk increases with loose monetary policy.

However, after considering the impact of strengthened capital controls under Basel III, the results show that bank risk does not increase with loose monetary policy before the implementation of Basel III. Yet, after Basel III implementation in 2013, loose monetary policy tends to increase bank risk, suggesting that banks exhibit risk-taking behavior in response to stricter bank capital regulations, aligning with the regulatory hypothesis. Regardless of whether bank characteristics are calculated using C1 or C2, and after taking the effects of financial crises and the interaction between bank characteristics and monetary policy into consideration, the inference that bank risk increases with strengthened capital regulations can still hold.

Moreover, when considering the influence of differences in monetary policy intervals on bank risk response to loose monetary policy, the findings suggest that the phenomenon of bank risk increasing with loose monetary policy only occurs during periods of loose monetary policy. During periods of monetary policy tightening, this phenomenon does not hold, indicating that banks do not exhibit risk-taking behavior. These conclusions are consistent whether using Z-scores or the loan-to-default ratio to represent bank risk, particularly evident when the loan-to-default ratio is utilized as a substitute variable for bank risk. Regardless of the calculation method for bank characteristics or additional considerations, such as financial crises and the interaction between bank characteristics and monetary policy, the results clearly indicate that bank risk-taking behavior varies with different monetary policy intervals, with banks exhibiting risk-taking behavior during loose monetary policy phases and not during periods of monetary policy tightening.

In terms of policy implications, with the Financial Supervisory Commission designating six banks as domestic systemically important banks (D-SIBs) and requiring these banks to increase their common equity Tier 1 capital ratio, Tier 1 capital ratio, and capital adequacy ratio annually, there's a concern raised by the inference obtained from this study regarding the relationship between increased bank capital regulation and bank risk-taking behavior. By requiring D-SIBs to enhance their capital as part of macroprudential policy, authorities aim to reduce market systemic risk and enhance the resilience of the financial system. However, there's a possibility that this requirement may inadvertently lead to increased risk-taking tendencies among these banks, potentially undermining their ability to cope with financial crises. This highlights the importance for authorities to closely observe and supervise the effects of such policies.

Furthermore, in terms of the transmission of monetary policy effects, with the implementation of Basel III bank capital regulation, the channel through which monetary policy affects bank risk-taking behavior emerges with loose monetary policy, enhancing the transmission of loose monetary policy effects. Additionally, in the loose monetary policy interval, there is also the emergence of the bank risk-taking channel in monetary policy transmission, which positively impacts the effectiveness of loose monetary policy. Therefore, in addition to traditional monetary policy transmission mechanisms such as the interest rate channel, balance sheet channel, and bank lending channel, monetary authorities need to consider the impact and role of the bank risk-taking channel when evaluating policy effectiveness, especially when implementing loose measures.

Table 1：Monetary policy and bank risk-taking

	Z-score and C1		Z-score and C2	
estimate	M1	M2	M1	M2
α_1	0.704(0.036)***	0.303(0.089)***	0.750(0.050)***	0.173(0.080)**
β	0.339(0.179)*	-0.826(0.237)***	0.111(0.180)	-1.186(0.196)***
λ	0.187(0.184)	1.209(0.460)***	0.252(0.229)	1.815(0.386)***

ρ	7.717(6.636)	46.58(22.79)**	8.496(6.586)	19.83(10.32)*
δ	1.050(1.566)	-0.025(6.581)	1.295(1.764)	1.009(1.731)
υ	-0.104(0.019)***	-0.117(0.018)***	-0.108(0.021)***	-0.117(0.015)***
ω	0.223(0.073)***	0.400(0.069)***	0.293(0.075)***	0.468(0.060)***
ξ	-0.032(0.017)*	-0.015(0.017)	-0.031(0.017)*	-0.007(0.014)
α_0	1.552(0.193)***	3.262(0.447)***	-2.944(2.959)	-22.32(5.290)***
Hansen test	0.140	0.186	0.132	0.182
AR(1)/AR(2)	0.000/0.151	0.002/0.193	0.000/0.190	0.001/0.218
	NPL and C1		NPL and C2	
estimate	M1	M2	M1	M2
α_1	0.575(0.101)***	0.381(0.131)***	0.518(0.146)***	0.377(0.164)**
β	0.546(0.126)***	0.687(0.212)***	0.533(0.136)***	0.583(0.193)***
λ	-0.160(0.155)	-0.280(0.216)	-0.324(0.269)	-0.312(0.274)
ρ	-6.794(5.724)	-6.193(5.114)	-6.917(4.803)	-6.739(4.724)
δ	1.117(0.553)**	0.637(0.450)	0.409(0.566)	-0.183(0.496)
υ	-0.014(0.009)	-0.017(0.008)**	-0.016(0.009)*	-0.020(0.008)***
ω	-0.050(0.023)**	-0.117(0.062)**	-0.059(0.039)	-0.106(0.066)
ξ	-0.002(0.007)	-0.008(0.009)	-0.004(0.007)	-0.009(0.010)
α_0	0.276(0.099)***	0.202(0.095)**	5.173(4.110)	4.988(4.152)
Hansen test	0.162	0.166	0.196	0.176
AR(1)/AR(2)	0.249/0.363	0.245/0.371	0.248/0.355	0.242/0.351

Note: In the parentheses are standard deviations. ***, **, * indicate statistical significance at the 1%, 5%, and 10% levels, respectively. AR(1) and AR(2) represent first-order and second-order autocorrelation tests on the regression residuals. The Hansen test and the AR(1)/AR(2) statistics correspond to the p-values of the tests.

Table 2: Monetary policy, financial crisis and bank risk-taking

	Z-score and C1		Z-score and C2	
estimate	M1	M2	M1	M2
α_1	0.857(0.069)***	0.821(0.089)***	0.927(0.085)***	0.213(0.083)***
β	0.487(0.273)*	-0.360(0.165)**	0.217(0.201)	-1.185(0.196)***
λ	-0.091(0.250)	-0.330(0.269)	-0.277(0.270)	1.761(0.356)***
ρ	8.477(19.34)	6.678(7.398)	5.779(8.408)	19.72(10.79)*
δ	3.264(6.227)	0.230(1.952)	1.627(2.137)	0.507(1.579)
υ	-0.023(0.028)	-0.055(0.029)*	-0.048(0.028)*	-0.079(0.030)***
ω	0.257(0.073)***	0.416(0.078)***	0.283(0.082)***	0.471(0.065)***
ξ	-0.014(0.015)	-0.019(0.018)	-0.029(0.017)*	-0.002(0.014)
Criss dummy	0.947(0.262)***	0.804(0.227)***	0.863(0.256)***	0.450(0.343)
α_0	0.587(0.398)	0.758(0.490)	3.380(3.529)	-21.82(4.947)***
Hansen test	0.331	0.123	0.138	0.215
AR(1)/AR(2)	0.000/0.203	0.000/0.340	0.000/0.202	0.001/0.287
	NPL and C1		NPL and C2	
estimate	M1	M2	M1	M2
α_1	0.496(0.159)***	0.338(0.148)**	0.412(0.192)***	0.286(0.170)*

β	0.536(0.138)***	0.606(0.181)***	0.579(0.159)***	0.602(0.168)***
λ	-0.148(0.184)	-0.242(0.197)	-0.376(0.290)	-0.346(0.266)
ρ	-6.517(6.034)	-6.929(4.842)	-7.189(4.746)	-6.855(4.534)
δ	0.598(0.453)	-0.025(0.279)	-0.032(0.674)	-0.575(0.724)
υ	0.021(0.034)	0.014(0.023)	0.022(0.030)	0.012(0.019)
ω	-0.048(0.028)*	-0.100(0.053)*	-0.075(0.044)*	-0.113(0.060)*
ξ	0.001(0.003)	-0.004(0.006)	0.001(0.004)	-0.005(0.007)
Criss dummy	0.414(0.357)	0.385(0.247)	0.446(0.337)	0.378(0.216)*
α_0	0.167(0.043)***	0.100(0.055)*	5.869(4.362)	5.420(4.016)
Hansen test	0.179	0.156	0.175	0.159
AR(1)/AR(2)	0.241/0.341	0.242/0.360	0.244/0.339	0.245/0.353

Table 3: Monetary policy, bank characteristics and bank risk-taking

	Z-score and C1		Z-score and C2	
estimate	M1	M2	M1	M2
α_1	0.712(0.039)***	0.361(0.094)***	0.773(0.065)***	0.196(0.073)***
β	0.483(0.209)**	-0.648(0.293)**	-3.029(3.269)	-1.869(3.237)
λ	0.235(0.198)	0.958(0.439)**	0.006(0.265)	1.629(0.320)***
ρ	9.789(7.427)	43.17(28.53)	10.64(10.07)	21.22(13.36)
δ	1.292(1.457)	1.489(9.058)	0.835(0.215)	1.366(1.743)
σ	0.234(0.150)	0.061(0.139)	0.249(0.202)	0.095(0.204)
τ	5.576(2.749)**	-4.137(5.933)	1.262(13.38)	-2.526(9.548)
ς	-3.719(2.529)	-4.491(4.821)	-3.564(2.764)	-2.228(2.204)
υ	-0.100(0.021)***	-0.117(0.020)***	-0.116(0.018)***	-0.117(0.015)***
ω	0.229(0.072)***	0.411(0.062)***	0.354(0.081)***	0.468(0.058)***
ξ	-0.034(0.016)**	-0.018(0.019)	-0.037(0.017)**	-0.007(0.015)
α_0	1.482(0.213)***	3.046(0.517)***	0.137(3.461)	-20.04(4.392)***
Hansen test	0.159	0.273	0.134	0.224
AR(1)/AR(2)	0.001/0.113	0.002/0.219	0.000/0.261	0.001/0.221
	NPL and C1		NPL and C2	
estimate	M1	M2	M1	M2
α_1	0.573(0.115)***	0.387(0.138)***	0.539(0.140)***	0.357(0.159)**
β	0.458(0.115)***	0.592(0.209)***	2.176(1.137)*	2.530(1.087)**
λ	-0.157(0.148)	-0.208(0.196)	-0.269(0.243)	-0.278(0.241)
ρ	-8.228(6.865)	-7.394(6.257)	-4.671(3.942)	-6.964(5.514)
δ	1.459(0.697)**	0.061(0.477)	0.804(0.593)	-0.705(0.598)
σ	-0.162(0.085)*	-0.145(0.072)**	-0.153(0.074)**	-0.168(0.072)**
τ	0.699(2.295)	0.777(2.086)	-0.376(1.951)	-0.797(1.978)
ς	2.207(1.162)*	1.530(0.691)**	2.327(0.846)***	1.975(0.957)**
υ	-0.016(0.009)*	-0.018(0.008)**	-0.017(0.008)**	-0.019(0.008)**
ω	-0.049(0.030)	-0.103(0.065)	-0.056(0.038)	-0.098(0.060)
ξ	-0.003(0.005)	-0.006(0.008)	-0.002(0.005)	-0.006(0.008)
α_0	0.294(0.122)**	0.227(0.095)**	4.235(2.593)	4.668(3.760)
Hansen test	0.338	0.281	0.496	0.245
AR(1)/AR(2)	0.250/0.352	0.347/0.367	0.245/0.342	0.243/0.359

Table 4:Basel III regulation, monetary policy and bank risk-taking

	Z-score and C1		Z-score and C2	
estimate	M1	M2	M1	M2
α_1	0.368(0.078)***	0.167(0.095)*	0.668(0.056)***	0.273(0.119)**
β_1	-0.279(0.373)	-0.801(0.325)**	-0.781(0.202)***	-0.594(0.325)*
β_2	8.369(2.638)***	2.304(0.601)***	10.94(2.136)***	1.704(0.500)***
λ	1.577(0.367)***	1.525(0.495)***	0.006(0.376)	0.897(0.309)***
ρ	51.52(21.09)***	62.71(26.75)**	29.01(24.09)	28.04(14.84)*
δ	8.039(6.467)	7.374(6.549)	7.505(6.054)	3.378(5.798)
υ	-0.112(0.022)***	-0.094(0.022)***	-0.140(0.020)***	-0.096(0.017)***
ω	0.302(0.090)***	0.304(0.091)***	0.483(0.075)***	0.304(0.081)***
ξ	-0.046(0.026)*	-0.040(0.022)*	-0.091(0.019)***	-0.029(0.022)
α_0	2.411(0.398)***	3.476(0.514)***	-2.104(6.169)	-11.59(4.875)**
Hansen test	0.286	0.208	0.325	0.172
AR(1)/AR(2)	0.002/0.116	0.004/0.151	0.000/0.102	0.007/0.172
	NPL and C1		NPL and C2	
estimate	M1	M2	M1	M2
α_1	0.503(0.126)***	0.285(0.164)*	0.449(0.164)***	0.148(0.187)
β_1	0.659(0.177)***	0.744(0.221)***	0.672(0.217)***	0.780(0.167)***
β_2	-3.924(1.680)**	-0.951(0.559)*	-3.782(1.489)**	-1.225(0.446)***
λ	-0.155(0.152)	-0.281(0.222)	-0.310(0.271)	-0.624(0.368)*
ρ	-7.489(5.598)	-6.065(4.380)	-7.831(5.310)	0.411(3.040)
δ	0.546(0.506)	0.464(0.360)	-0.095(0.581)	-0.510(0.719)
υ	-0.004(0.012)	-0.013(0.008)	-0.005(0.011)	-0.015(0.006)**
ω	-0.098(0.046)**	-0.134(0.061)**	-0.117(0.059)**	-0.162(0.062)***
ξ	0.014(0.005)***	0.005(0.003)*	0.014(0.004)***	0.005(0.004)
α_0	0.481(0.193)**	0.398(0.191)**	5.354(4.201)	9.006(5.327)*
Hansen test	0.211	0.172	0.314	0.200
AR(1)/AR(2)	0.260/0.402	0.276/0.516	0.263/0.404	0.301/0.700

Table 5: Basel III regulation, monetary policy, financial crisis and bank risk-taking

	Z-score and C1		Z-score and C2	
estimate	M1	M2	M1	M2
α_1	0.377(0.094)***	0.179(0.107)*	0.340(0.110)***	0.644(0.086)***
β_1	-0.318(0.475)	-0.782(0.380)**	-0.480(0.487)	-0.302(0.228)
β_2	8.099(2.635)***	2.299(0.595)***	7.138(2.972)**	1.773(0.477)***
λ	1.466(0.432)***	1.484(0.505)***	1.600(0.390)***	0.113(0.291)
ρ	57.44(20.17)***	62.19(27.69)**	55.71(23.76)**	23.14(21.59)
δ	8.295(6.198)	7.285(8.628)	11.21(7.605)	4.349(6.509)
υ	-0.106(0.036)***	-0.086(0.041)**	-0.080(0.036)**	-0.037(0.033)
ω	0.325(0.114)***	0.307(0.100)***	0.406(0.109)***	0.334(0.068)***
ξ	-0.045(0.025)*	-0.037(0.020)*	-0.032(0.029)	-0.039(0.020)*
Criss Dummy	0.099(0.306)	0.092(0.384)	0.344(0.342)	0.790(0.328)**
α_0	2.328(0.525)***	3.395(0.571)***	-24.92(6.015)***	-2.593(5.262)

Hansen test	0.210	0.175	0.169	0.160
AR(1)/AR(2)	0.004/0.127	0.004/0.148	0.005/0.123	0.000/0.139
	NPL and C1		NPL and C2	
estimate	M1	M2	M1	M2
α_1	0.096(0.183)	0.246(0.142)*	0.270(0.149)*	0.198(0.158)
β_1	0.985(0.217)***	0.652(0.173)***	0.827(0.176)***	0.651(0.156)***
β_2	-7.687(2.585)***	-0.829(0.444)*	-4.841(1.301)***	-0.810(0.407)**
λ	-0.598(0.350)*	-0.270(0.195)	-0.387(0.261)	-0.355(0.263)
ρ	-3.605(3.356)	-7.571(4.032)*	-7.999(4.244)*	-7.185(3.648)**
δ	-0.786(0.948)	-0.206(0.404)	-0.630(0.770)	-0.808(0.767)
υ	0.119(0.047)**	0.020(0.017)	0.051(0.022)**	0.018(0.013)
ω	-0.180(0.048)***	-0.114(0.049)**	-0.161(0.053)***	-0.127(0.053)**
ξ	0.048(0.013)***	0.008(0.003)***	0.024(0.004)***	0.007(0.003)**
Criss Dummy	1.302(0.492)***	0.397(0.191)**	0.649(0.227)***	0.399(0.166)**
α_0	0.450(0.129)***	0.276(0.128)**	6.398(3.990)	5.768(3.972)
Hansen test	0.155	0.116	0.156	0.118
AR(1)/AR(2)	0.230/0.357	0.265/0.402	0.259/0.394	0.269/0.410

Table 6: Basel III regulation, monetary policy, bank characteristics and bank risk-taking

	Z-score and C1		Z-score and C2	
estimate	M1	M2	M1	M2
α_1	0.665(0.090)***	0.593(0.078)***	0.034(0.199)	0.052(0.153)
β_1	-0.681(0.642)	-0.526(0.249)**	-10.28(14.98)	-0.646(0.299)**
β_2	9.534(3.054)***	1.440(0.442)***	564.3(279.6)**	57.88(22.21)**
λ	0.032(0.523)	-0.106(0.338)	2.403(0.652)***	1.949(0.573)***
ρ	28.92(32.50)	8.022(17.39)	41.99(23.59)*	35.07(21.92)
δ	7.246(8.604)	2.852(2.733)	-1.686(10.83)	0.035(7.336)
σ_1	0.413(1.168)	0.057(0.189)	0.694(0.991)	-0.851(0.943)
σ_2	2.289(8.022)	0.525(0.683)	-44.81(22.25)	-3.966(1.885)**
τ_1	-17.09(24.87)	-2.444(8.922)	2.016(30.49)	-4.497(19.51)
τ_2	-334.2(412.9)	34.69(48.23)	486.6(731.9)	-46.42(94.93)
ς_1	-1.773(9.302)	-3.106(2.848)	3.050(12.69)	-3.275(6.429)
ς_2	-74.97(105.3)	-11.96(24.71)	56.69(146.4)	1.989(39.84)
υ	-0.129(0.031)***	-0.126(0.018)***	-0.035(0.019)*	-0.081(0.018)***
ω	0.487(0.083)***	0.389(0.069)***	0.253(0.094)***	0.266(0.082)***
ξ	-0.082(0.022)***	-0.053(0.018)***	0.013(0.036)	0.001(0.024)
α_0	1.189(0.431)***	1.831(0.438)***	-31.29(8.188)***	-24.76(7.605)***
Hansen test	0.326	0.210	0.666	0.397
AR(1)/AR(2)	0.001/0.253	0.000/0.223	0.011/0.137	0.037/0.405
	NPL and C1		NPL and C2	
estimate	M1	M2	M1	M2
α_1	0.484(0.125)***	0.188(0.237)	0.367(0.187)**	0.107(0.210)

β_1	0.626(0.166)***	0.725(0.267)***	3.424(1.365)**	6.723(2.019)***
β_2	-3.931(1.874)**	-1.245(0.753)*	-50.42(26.45)*	-25.05(12.34)**
λ	-0.230(0.160)	-0.549(0.393)	-0.522(0.355)	-0.704(0.450)
ρ	-8.417(4.784)*	-5.408(6.420)	-10.16(6.558)	-4.149(9.338)
δ	0.584(0.697)	-1.580(1.766)	-0.085(0.730)	-1.805(1.608)
σ_1	-0.121(0.077)	-0.264(0.087)***	-0.216(0.091)**	-0.447(0.141)***
σ_2	0.919(0.895)	0.727(0.615)	3.094(1.761)*	1.501(0.795)*
τ_1	0.014(3.032)	-1.406(2.819)	-0.747(0.282)	-3.466(4.325)
τ_2	32.07(64.80)	17.78(21.83)	51.34(86.33)	33.14(22.38)
ς_1	1.962(1.399)	1.069(0.933)	1.499(1.051)	0.451(1.309)
ς_2	-0.934(20.53)	9.991(7.851)	2.538(29.04)	11.41(9.154)
υ	-0.004(0.012)	-0.012(0.008)	-0.007(0.011)	-0.018(0.007)***
ω	-0.107(0.047)**	-0.139(0.068)**	-0.144(0.067)**	-0.138(0.047)***
ξ	0.016(0.006)**	0.011(0.005)**	0.015(0.005)***	0.006(0.003)*
α_0	0.506(0.205)**	0.554(0.304)*	8.492(5.387)	10.58(6.52)
Hansen test	0.447	0.303	0.249	0.313
AR(1)/AR(2)	0.265/0.394	0.300/0.646	0.270/0.529	0.307/0.750

Table 7: Monetary policy regimes and bank risk-taking

	Z-score and C1		Z-score and C2	
estimate	M1	M2	M1	M2
α_1	0.328(0.082)***	0.644(0.060)***	0.249(0.079)***	0.203(0.070)***
β_1	0.836(0.351)**	-1.680(0.478)***	0.470(0.377)	-1.508(0.644)**
β_2	-1.979(0.359)***	-0.695(0.165)***	-1.866(0.438)***	1.025(0.227)***
λ	0.589(0.225)***	0.023(0.215)	1.006(0.254)***	1.603(0.332)***
ρ	15.86(8.788)*	8.462(7.431)	10.52(8.960)	22.31(9.794)**
δ	-1.480(2.099)	1.165(1.812)	-1.130(2.959)	1.210(1.694)
υ	-0.147(0.016)***	-0.116(0.017)***	-0.141(0.016)***	-0.113(0.016)***
ω	0.245(0.069)***	0.464(0.078)***	0.285(0.067)***	0.465(0.074)***
ξ	-0.039(0.017)**	-0.030(0.016)*	-0.028(0.016)*	-0.012(0.013)
α_0	3.336(0.392)***	1.898(0.307)***	-10.70(3.688)***	-19.79(4.607)***
Hansen test	0.117	0.102	0.415	0.161
AR(1)/AR(2)	0.000/0.382	0.000/0.437	0.000/0.346	0.002/0.179
	NPL and C1		NPL and C2	
estimate	M1	M2	M1	M2
α_1	0.115(0.173)	0.426(0.122)***	-0.271(0.135)**	0.381(0.168)**
β_1	-1.634(0.860)*	0.709(0.533)	-2.119(0.502)***	0.543(0.457)
β_2	1.037(0.262)***	0.609(0.228)***	1.593(0.260)***	0.577(0.226)**
λ	-0.351(0.236)	-0.180(0.140)	-0.524(0.285)*	-0.309(0.256)
ρ	-3.910(2.461)	-6.241(3.395)*	-9.369(4.731)**	-6.450(4.577)
δ	-1.970(1.712)	0.292(0.407)	-1.683(1.362)	-0.102(0.594)

υ	-0.052(0.015)***	-0.018(0.009)**	-0.056(0.018)***	-0.021(0.008)***
ω	0.133(0.079)*	-0.102(0.075)	0.107(0.058)*	-0.101(0.080)
ξ	-0.010(0.007)	-0.008(0.008)	-0.011(0.009)	-0.009(0.009)
α_0	0.276(0.072)***	0.177(0.065)***	8.501(4.429)*	4.907(3.858)
Hansen test	0.276	0.158	0.182	0.189
AR(1)/AR(2)	0.285/0.379	0.242/0.368	0.399/0.346	0.241/0.352

Table 8: Monetary policy regimes, financial crisis and bank risk-taking

	Z-score and C1		Z-score and C2	
estimate	M1	M2	M1	M2
α_1	0.741(0.101)***	0.760(0.073)***	0.730(0.087)***	0.213(0.077)***
β_1	3.757(0.956)***	-1.256(0.512)**	3.914(0.840)***	-1.514(0.631)**
β_2	-2.351(0.578)***	-0.555(0.165)***	-2.484(0.463)***	1.057(0.208)***
λ	-0.117(0.296)	-0.213(0.237)	-0.127(0.277)	1.570(0.313)***
ρ	8.586(13.55)	4.884(8.949)	10.78(17.96)	21.84(10.06)**
δ	3.092(4.278)	0.473(1.421)	3.692(5.663)	1.049(1.672)
υ	0.138(0.048)**	-0.064(0.028)**	0.135(0.046)***	-0.104(0.029)***
ω	0.157(0.095)*	0.467(0.072)***	0.143(0.081)*	0.473(0.073)***
ξ	-0.009(0.016)	-0.025(0.015)*	-0.010(0.015)	-0.010(0.014)
Criss Dummy	3.224(0.531)***	0.707(0.211)***	3.261(0.516)***	0.095(0.367)
α_0	0.953(0.489)*	1.137(0.415)***	1.474(4.458)	-19.34(4.474)***
Hansen test	0.226	0.120	0.250	0.137
AR(1)/AR(2)	0.001/0.120	0.000/0.374	0.000/0.103	0.002/0.206
	NPL and C1		NPL and C2	
estimate	M1	M2	M1	M2
α_1	0.142(0.163)	0.345(0.205)*	-0.275(0.146)*	0.264(0.185)
β_1	-2.689(1.303)**	0.648(0.594)	-1.465(0.748)**	0.986(0.705)
β_2	2.632(0.879)***	0.596(0.248)**	1.125(0.372)***	0.663(0.240)***
λ	-0.289(0.247)	-0.111(0.256)	-0.513(0.314)	-0.309(0.220)
ρ	-3.265(2.702)	-3.787(3.205)	-9.026(5.028)*	-6.483(3.639)*
δ	1.864(1.170)	2.203(1.985)	-1.637(1.213)	0.816(1.032)
υ	-0.114(0.053)**	0.001(0.020)	-0.021(0.032)	0.021(0.027)
ω	0.046(0.045)	-0.102(0.074)	0.090(0.061)	-0.135(0.086)
ξ	-0.009(0.011)	-0.008(0.009)	-0.010(0.009)	-0.003(0.004)
Criss Dummy	-1.393(0.702)**	0.193(0.241)	0.563(0.248)**	0.472(0.320)
α_0	0.393(0.136)***	0.161(0.087)*	8.287(4.858)*	4.873(3.275)
Hansen test	0.162	0.257	0.166	0.115
AR(1)/AR(2)	0.282/0.785	0.271/0.407	0.422/0.398	0.247/0.353

Table 9: Monetary policy regimes, bank characteristics and bank risk-taking

	Z-score and C1		Z-score and C2	
estimate	M1	M2	M1	M2
α_1	-0.196(0.098)**	0.611(0.076)***	0.387(0.143)***	0.656(0.066)***
β_1	1.622(0.882)*	-1.937(0.584)***	13.70(36.70)	18.16(29.27)

β_2	-1.253(0.490)**	-0.673(0.223)***	-15.37(24.91)	1.724(8.682)
λ	0.990(0.393)**	0.025(0.254)	0.661(0.545)	0.155(0.371)
ρ	31.51(12.72)**	11.33(14.32)	45.27(43.47)	16.05(17.05)
δ	-5.962(2.741)**	1.578(4.081)	2.785(11.30)	4.331(5.991)
σ_1	-3.992(2.022)**	-0.108(1.738)	-1.388(2.133)	-1.004(1.538)
σ_2	2.668(1.342)**	0.123(0.207)	1.327(1.635)	-0.089(0.553)
τ_1	-186.5(121.5)	-4.572(117.3)	43.35(111.8)	-60.97(140.0)
τ_2	106.0(56.43)*	1.363(7.877)	-27.18(58.89)	-4.283(14.70)
ς_1	-12.10(9.981)	6.380(26.79)	9.084(28.99)	-13.14(41.06)
ς_2	-5.471(17.34)	-2.508(4.295)	-10.69(16.50)	-5.467(5.133)
υ	0.021(0.023)	-0.122(0.018)***	-0.144(0.025)***	-0.118(0.018)***
ω	-0.108(0.081)	0.451(0.083)***	0.342(0.069)***	0.454(0.079)***
ξ	0.027(0.015)*	-0.036(0.016)**	-0.033(0.018)*	-0.034(0.019)*
α_0	5.280(0.578)***	2.052(0.397)***	-9.918(9.230)	-2.055(5.736)
Hansen test	0.662	0.158	0.468	0.145
AR(1)/AR(2)	0.192/0.106	0.000/0.487	0.021/0.281	0.000/0.360
	NPL and C1		NPL and C2	
estimate	M1	M2	M1	M2
α_1	-0.063(0.098)	0.411(0.137)***	-0.080(0.094)	0.366(0.155)**
β_1	-2.258(0.936)**	0.561(0.480)	-15.73(6.377)**	4.070(6.213)
β_2	1.552(0.397)***	0.538(0.211)**	16.91(5.442)***	2.521(1.051)**
λ	-0.355(0.250)	-0.183(0.193)	-0.334(0.363)	-0.265(0.202)
ρ	-0.051(5.498)	-7.792(8.388)	-0.430(6.433)	-5.623(4.408)
δ	-0.675(1.898)	-0.157(1.057)	-1.709(1.894)	-0.464(0.791)
σ_1	0.485(0.359)	-0.125(0.270)	1.004(0.478)**	-0.138(0.322)
σ_2	-0.475(0.394)	-0.154(0.076)**	-1.112(0.329)***	-0.163(0.069)**
τ_1	4.615(10.41)	-11.76(15.08)	4.168(20.24)	-22.89(25.46)
τ_2	-5.538(15.12)	0.008(3.510)	-13.96(13.03)	-1.581(2.268)
ς_1	4.215(9.280)	-0.427(5.651)	2.411(5.217)	-0.817(6.583)
ς_2	-0.669(10.63)	1.815(1.167)	0.147(6.177)	1.874(0.918)**
υ	-0.053(0.021)**	-0.019(0.009)**	-0.052(0.014)***	-0.020(0.008)**
ω	0.134(0.060)***	-7.792(8.388)	0.092(0.030)***	-0.094(0.069)
ξ	-0.007(0.011)	-0.157(1.057)	-0.012(0.010)	-0.006(0.007)
α_0	0.289(0.108)***	0.217(0.090)**	5.202(4.894)	4.364(3.068)
Hansen 検定	0.230	0.281	0.269	0.285
AR(1)/AR(2)	0.293/0.709	0.244/0.362	0.308/0.590	0.245/0.363

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Analyzing the Financial Performance of Commercial Banks in India: Camel Model on YES Bank & SBI And Lakshmi Vilas Bank & DBS Bank India Ltd.

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Abstract
A bank plays an important role in maintaining the economical condition of the country. Sound financial position of a bank is the guarantee not only to its depositors but is equally significant for shareholders, employees and whole economy as well. This study analyzes the financial performance of YES Bank & SBI, Lakshmi Vilas Bank (LVB) & DBS Bank India Ltd (DBIL) for the period of 2009 – 2020 by using CAMEL Model. The findings of this research reveal that net NPA (Non Performing Assets) and more advances are the major reasons for YES bank crisis. YES bank performs well up to 2017 but after that it begins to fall in terms of interest income, net profits etc., in 2020 its profit shows negative value. On the other hand, bad loans and capital inadequacy are the major reasons for failure of Lakshmi Vilas Bank (LVB) as its NPA and Advances increased excessively during the period of study.

Keywords: Capital Adequacy, Assets Quality, Management Risk, Earnings, Liquidity, CAMEL Model, PRISMA Model

1. Introduction

Banking sector in India consists of public sectors banks (PSBs), private sector banks, foreign banks, regional rural banks, and co-operative banks etc. The banking and financial sector is continuously playing a significant role in building strong economy of a nation (Al-Homaidi et al. 2018). Banks are a very significant part of the economy because they provide fundamental services to citizens of country and businesses. As a financial services provider, they give depositors a protected place to accumulate their savings. Banks are considered as revenue of the financial system of the country which helps to accelerate the income and savings from one hand to another hand (Murthy and Pathi, 2013).

The private as well as public sector banks are concentrating on comprehension of the drivers of success which includes better use of its resources like technology, infrastructure, human capital, the process of delivering quality service to its customers and performance benchmarking. Failure of banks may affects not only the domestic economy but also put the global economy at stake. According to Lawerence et al. (2015) the failure of any bank has significant economic effect on its owners, creditors, society and the economy of the country. The failure of banks is a regular feature of banking industry and Indian banking system is no exception to it. To avoid failure of banks, researchers have developed many financial models and parameters to monitor health of banking sector. Still the failure of banks cannot be avoided.

In this study, the analysis is done by using CAMEL Model/ Framework of two failed banks in India i.e. Lakshmi Vilas Bank (LVB) that merged with DBS Bank India Ltd. (DBIL) and YES Bank restructured with SBI. CAMEL framework is the model which measures the financial performance of banks in terms of five features Capital adequacy, Assets quality, Risk Management, Earning quality and Liquidity (Rauf, 2016). The research paper consists, brief description of banking sector in India, justification of the study, Research methodology, review of literature and analysis of data & interpretation of results.

1.1 Brief Description of Banking Sector in India

The features of different categories of banks in India in the form of their definition as defined in the literature and government documents are presented in this sub section. The classification of banks is presented in figure 1. It is evident from figure 1 that Indian banking sector consists of different categories of banks with regulation for each category.

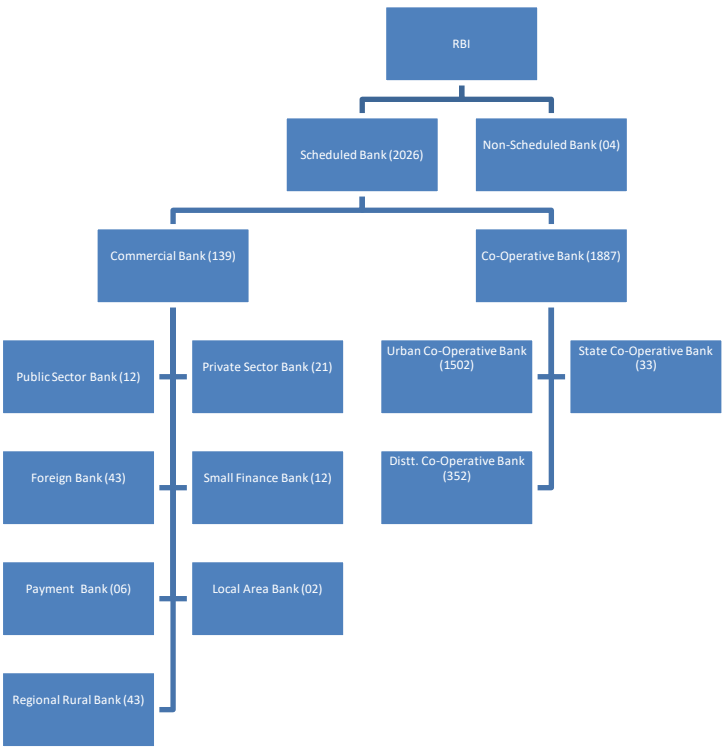

Figure 1: Banking Sector in India

Source: rbi.org.in (Jan, 2024)

Private Banks in India makes sizeable contribution to the banking sector and defined by different research experts in their own way. Few definitions are listed in the following:

Definition 1: Private Sector Banks are financial institutions that primarily owned and operated by high-net-worth private individuals and business organizations (Ray and Raha, 2023).

Definition 2: Private banking consists of personalized financial services and products offered to the high-net-worth individual (HNWI) clients of a retail bank or other financial institution (James, 2022).
Definition 3: Private Sector Banks are financial institutions that are owned and operated by private individuals or corporations, rather than the government (Mubarak and Nadaf, 2021).
Definition 4: The banks in which the maximum stake of shares or equity is maintained and owned by private individuals (Jha, 2018).
Definition 5: The Indian Banking System comprises two major sectors of Banks i.e. Public and Private Sector Banks. The former is controlled by the Government and the latter's shares or equity is held by private shareholders, (Kumar and Shetty, 2022).

Public banks in India make sizeable contribution to the banking sector and defined by different research experts in their own way. Few definitions are listed in the following:

Definition 1: Public Sector Banks are financial institutions that are owned and operated by the government (Das and Dutta, 2014).
Definition 2: Public sector banks or nationalized banks are those in which the government has retained a majority of its share with the primary aim of public interest (Gupta, 2014).
Definition 3: Public Sector Banks are the banks whose majority of stakes are held by the state or central government (Jha, 2018).
Definition 4: The banks in which the Govt. of India holds more than 50% of the total stake are called Public Sector Banks (Kaur, 2015).

2. Need of the study

As evident from the data presented in the subsequent sections of the research paper, YES bank and Lakshmi Vilas Bank (LVB) have been running smoothly for large number of years and their share prices have been increasing over the year. In the recent few years their financial performance started decreasing year by year which resulted in to their failure.
This necessitates the analysis of the financial data of these two banks to get inside of their failure. In addition this study will contribute directly or indirectly towards the analyses of financial position of the banks in India. This research study will provide an understanding of the factors of failure of YES bank and Lakshmi Vilas Bank (LVB).

3.Research Methodology

3.1. Context

The Reserve Bank of India gives its inceptors to developing and implementing new policies with the sole objective of protecting customer’s investment as well as making the banking sector more stable and sustainable. Inspite of all efforts of RBI, banking sector in India often suffers from failure of some banks i.e. IDBI (failed bank) and LIC (stake controller of IDBI) (Jasrotia et al., 2022), PMC (failed bank) and Unity small finance bank ltd. (acquirer bank) (Singhal and Chauhan, 2021). Such happening in banking sector attracts the attention of academics, experts etc. to analyze the events which resulted in to failure of banks. This Paper is based on two cases that involved four banks, i.e. YES Bank & SBI and Lakshmi Vilas Bank (LVB) & DBS Bank India Ltd (DBIL).

3.2. Data and its collection

This research paper is based on secondary data collected from different sources about financial ratios and parameters of the banks reference.

The secondary data is collected from the official website of these four banks YES Bank& SBI and Lakshmi Vilas Bank (LVB)& DBS Bank India Ltd (DBIL) and also from other financial sites such as money control, yahoo finance etc.

Table 1: Abbreviations used for sample banks

Sr. No.	Name of Bank	Abbreviation Used
1.	State Bank of India	SBI
2.	Lakshmi Vilas Bank (LVB)	LVB
3.	DBS Bank India Ltd.	DBIL
4.	YES Bank	YES Bank

3.3. Data Analysis

This paper is an attempt to analyze the financial data of 2 failed banks i.e. YES bank and LVB using CAMEL Analysis/ Model. CAMEL model is a standardized financial rating system and short form for five measures adopted by the Federal Financial Institution Examination Council (FFIEC, U.S.) on 13 November 1979 (Babu and Kumar, 2017). The analysis is similar to the study which is based on the approach of American International Assurance where in 8 financial institutions (HDFC, ICICI, SBI, BOB, PNB, BOI, AXIS and Kotak Mahindra) were analyzed by Kumar & Sharma, 2014.

3.3.1 CAMEL and its parameters along with measures:

Select definitions of CAMEL model and its parameters are summarized in the following: In addition, CAMEL parameters, financial measure used in computation of CAMEL parameters, and list of researcher whose work is based on these parameters and measures are listed in table 2.

Definition 1: CAMEL is an acronym for five parameters (capital adequacy, assets quality, management soundness, earnings and liquidity), (Reddy, 2022).
Definition 2: CAMEL Framework is a tool to measure financial performance and has five parameters (capital adequacy, assets quality, management soundness, earnings and liquidity), (Parikh, 2018).
Definition 3: CAMEL Model is a vital tool to analyze the banks and financial institutions and has five parameters (capital adequacy, assets quality, management soundness, earnings and liquidity) (Mohan and Rao, 2021).

Table 2: Parameters used in CAMEL by various authors

Parameters in CAMEL	Measures	Sources
Capital Adequacy (C)	Capital Adequacy Ratio, Tier I Capital Ratio, Debt Equity Ratio	Crowley et al. (2022), Manoj (2010), Kumar and Sharma (2014), Sangmi and Nazir (2010), Rauf (2016)
Assets Quality (A)	Priority Sector Advances to Total Advances, Secured Advances to Total Advances, Net NPA to Net Advances	Yang and Zhao (2009), Manoj (2010), Kumar and Sharma (2014), Sangmi and Nazir (2010), Rauf (2016)
Management Quality/ Risk (M)	Business per Employee, Return on Equity, Return on Advances, Return on Capital Employed, Profit per Employee,	Saif and Saha (2017), Manoj (2010), Kumar and Sharma (2014), Sangmi and Nazir (2010), Rauf (2016)
Earnings (E)	Operating Profit to Total Assets, Interest Income to Total Assets, Basic Earnings Per Share, Net Interest Margin to Total Assets, Return on Assets, Non Interest Income to Total Assets	Manoj (2010), Kumar and Sharma (2014), Sangmi and Nazir (2010), Rauf (2016)
Liquidity (L)	Cash Deposit Ratio, Credit Deposit Ratio, Current Ratio, Quick Ratio, Liquid Assets to Total Assets Ratio	Manoj (2010), Kumar and Sharma (2014), Sangmi and Nazir (2010), Rauf (2016)

Source: Compiled by Author(s)

3.4. Research Objectives

The study is about three objectives of the present study, in the context of failure of YES Bank and LVB, and the role of State Bank of India and DBIL are listed as under:

Objective 1: To study the factors of failure of YES bank and Lakshmi Vilas Bank (LVB).
Objective 2: To analyze the NPAs, Capital Adequacy, Risk Management, Liquidity etc. by using CAMEL model on four banks i.e. YES Bank, SBI (acquirer bank) and Lakshmi Vilas Bank (LVB), DBS Bank India ltd. (DBIL) (acquirer bank).
Objective 3: To suggest the policy initiatives/ interventions to regulators to avoid failure of a private bank in future.

3.5. Scope of the study

This research paper focuses on the analysis of financial performance of these banks using CAMEL Model. The data used for the purpose is for the years 2009 to 2020 which are collected from the annual reports of these banks and from the financial websites as moneycontrol.com. It reveals only financial performance of the bank during that period only.

4. Review of Literature

Review of literature consists of two parts. Part 1 consists of identification of research articles from the scientific databases. For the purpose of identification of research articles PRISMA Model (Page et al. 2021) is used. Part 2 embodies of review of literature of selected research papers. The Review of literature is carried out on two aspects, i.e. factors responsible for failure of a bank and application of CAMEL Model used to measure financial performance of a bank.

4.1 Key Factors for failure of a Bank

This section presents the review of existing literature on factors of failure of a commercial bank such as NPAs, risk management, bank fraud, capital inadequacy etc.

Identification of research article: The research articles were identified by searching database such as Google scholar, Jgate plus, Dimensions AI, Research gate etc. It includes all published articles and reports. The processes are explained in table 3a, 3b, 3c and 3d.

Table 3a: Keywords, Data bases and no. of relevant articles

S. N	Databases	Keywords	Year/ period	Geographical reach	Type of Journal	Total articles	Irrelevant article	Common article	Relevant article
1	Google scholar	Factors for bank failure	2010-2024	Indian banking sector	Banking/ Finance/ Management/ Economics/ Multidisciplinary Research	18	14	4	0
2		Excessive NPA in banks				28	20	7	1
3		Capital inadequacy and bank failure				19	15	4	0
4		Bank frauds and insider frauds				34	27	6	1
5		Inadequate liquidity, poor risk management and				23	19	3	1

		bank performance							
	Total					122	95	24	3

Table 3b: Keywords, Data bases and no. of relevant articles

Sr. No.	Databases	Keywords	Year/ period	Geographical reach	Type of Journal	Total articles	Irrelevant articles	Common article	Relevant article
1	Dimension AI	Factors for bank failure	2010-2024	Indian Banking System	Banking/ Finance/ Management/ Economics/ Multidisciplinary Research	10	5	4	1
2		Excessive NPA in banks				17	7	7	3
3		Capital inadequacy and bank failure				14	9	4	1
4		Bank frauds and insider frauds				19	11	6	2
5		Inadequate liquidity, poor risk management and bank performance				9	6	3	0
	Total					69	38	24	7

Table 3c: Keywords, Data bases and no. of relevant articles

Sr. No.	Databases	Keywords	Year/ period	Geographical reach	Type of Journal	Total article	Irrelevant articles	Common article	Relevant article
1	Jgate plus	Factors for bank failure	2010-2024	Indian banking sector	Banking/ Finance/ Management/ Economics/ Multidisciplinary Research	15	10	4	1
2		Excessive NPA in banks				23	15	7	1
3		Capital inadequacy and bank failure				15	10	4	1
4		Bank frauds and insider frauds				17	10	6	1
5		Inadequate liquidity, poor risk management and bank performance				8	4	3	1
	Total					78	49	24	5

Table 3d: Keywords, Data bases and no. of relevant articles

Sr. No.	Databases	Keywords	Year/ period	Geographical reach	Type of Journal	Total articles	Irrelevant articles	Common article	Relevant article
1	Researchgate	Factors for bank failure	2010-2024	Indian banking sector	Banking/ Finance/ Management/ Economics/ Multidisciplinary Research	8	4	4	0
2		Excessive NPA in banks				15	7	7	1
3		Capital inadequacy and bank failure				13	8	4	1
4		Bank frauds and insider frauds				19	12	6	1
5		Inadequate liquidity, poor risk management and bank performance				15	12	3	0
	Total					70	43	24	3

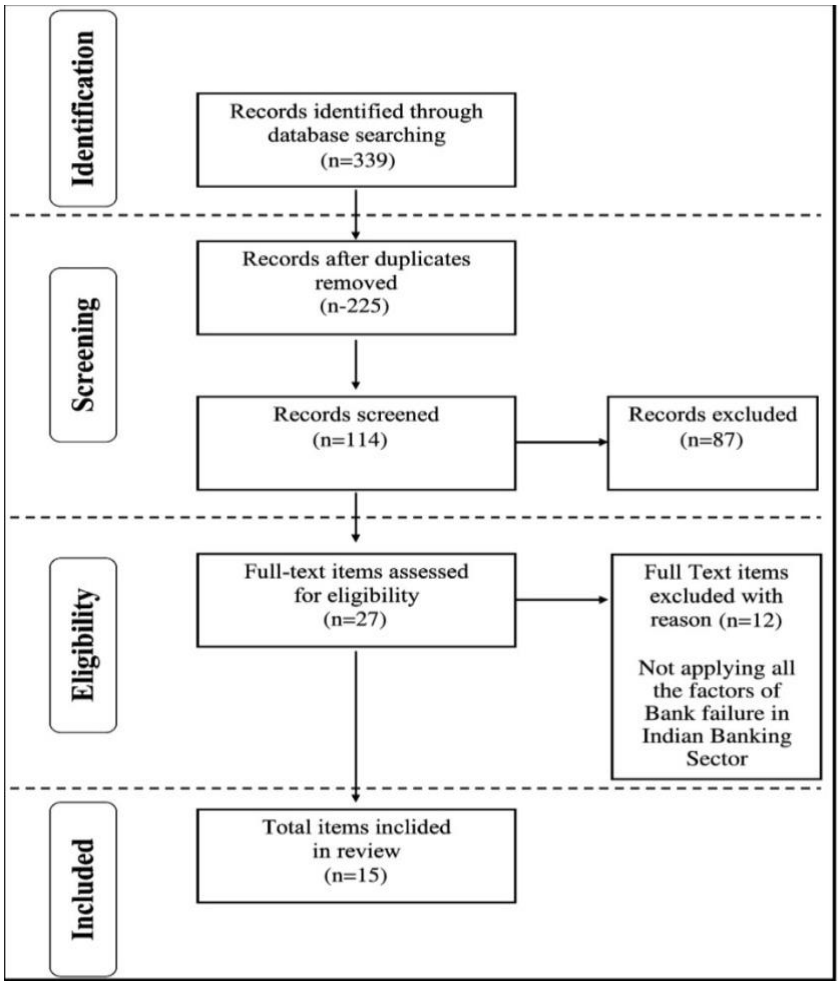

Figure 2: Flow Chart of PRISMA Model

Source: page et al. 2021

The process of search was based on PRISMA Model as explained in figure 2. The period of search was, from 2010 to 2024. These selected search articles are reviewed in the following.

Khanna and Arora (2010) indicated that lack of training, overburdened staff, competition, low compliance level (the degree to which procedures and prudential practices framed by Reserve bank of India to prevent frauds are followed) are the main causes of bank frauds. Millon (2011)has clarified in his examination that since a long time ago run thriving of company relies upon the prosperity of its different partners and investors and maintainability is likewise needful for current accessibility of common assets in which the organization can endure and prosper. Samad (2011) has examined the impact of capital adequacy in failed and non- failed bank. This paper finds significant differences in capital adequacy between the failed and survived banks. Patidar and Kataria (2012) analyzed the percentage share of NPA as components of priority sector lending, the comparative study was conducted between SBI and Associates, Old Private Banks and New Private Banks and Nationalized Banks, to find out the significant difference of the NPA and also find out the significant impact of Priority Sector Lending on the Total NPA of Banks using statistical tools like regression analysis and ratio analysis. Arora and Kumar (2014) analyzed the classification and comparison of loan assets of public and private sector banks. This study concluded that NPAs are still a threat to the banks and financial institution and public sector banks have higher level of NPAs in comparison to Private sector banks.

Memdani (2017) has examined the determinants of NPAs in the Indian Banking sector. The findings of the study reveal that there exists a negative correlation between NPAs and financial performance of a bank. Banerjee et al. (2018) uncovered in her examination that the administration is delegating its very own chiefs for

micromanagement has encouraged colleague private enterprise and open division banks experience the ill effects of over the top guideline with too huge an extent of their benefits being utilized to satisfy the administration's deficiency. Vani (2020) uncovered in her examination that the more NPAs or bad loads and non serious investors are the one of the major reasons for the failure of YES Bank during 2020.

Kumar and Upadhyay (2021) discussed the factors answerable for failure of YES Bank. The findings of the study reveal that Bad loans, Corporate Governance, excessive withdrawal are the main reasons for YES Bank failure. Lappay et al. (2021) examined the effect of risk and returns on Capital Adequacy Ratio of Commercial Banks in India. The findings of the article reveal that there is a negative correlation between risk and capital adequacy ratio of banks and there is a positive correlation between returns and capital adequacy ratio. Surapalli and Parashar (2021) had studied the relationship of corporate governance practice with the financial performance of the banks in India. The findings of the study reveal that there exists a positive correlation between corporate governance and financial performance of a bank. Kanoujiya et al. (2022) had studied the bankruptcy and financial distress of banks in India. A panel data analysis of 34 banks in India is performed for regression analysis. This study indicates that financial distress and inadequate liquidity are interrelated. Raut et al. (2022) examined the relationship between liquidity position and the financial performance of India's banks in both the public and private sectors. The findings of the study reveal that there exists a negative correlation between liquidity position and financial performance of a bank. Vyas and Shah (2023) analyzed 12 PSU and Private Sector Banks. The findings of the study reveal that private sector banks reported higher cases of frauds compare to PSU banks. Gunasekaran et al. (2024) analyzed that the highest per cent of NPA was recorded in the year 2018 while comparing figure with 2011 to 2022. Due to that the profitability of the banks has been declined.

4.2 CAMEL Analysis and financial position of banks

This section presents the review of existing literature on CAMEL Analysis and financial performance of banks in India. To complete the Systematic Literature Review on CAMEL analysis and financial performance, four databases such as Google scholar, Jgate plus, Dimensions AI, Researchgate are searched for keywords as mention in table 4. In all 20 research paper were identified for Systematic Literature Review.

Table 4: Keywords, Data bases and no. of relevant articles

Databases	Year/ period	Geogra-phical reach	Type of journal	Seaerch by	Total articles	Irrelevent articles	Common articles	Relevent articles
Google scholar	2010-2024	Indian banking sector	Banking/ Finance/ Management/ Economics/ Multidisciplinary Research	CAMEL and Bank Performance	73	28	38	07
Jgate plus				CAMEL Analysis and banking sector	60	22	30	08
Dimension AI,				CAMEL model and banks in India	44	35	07	02
Researchgate				CAMEL Model	43	12	28	03
	Total				220	97	103	20

The above table represents the databases, keywords and number of articles used for the review of literature. Literature has been broadly classified on the basis of analysis of bank performance of various Indian banks using CAMEL Model/ Framework from 2010 to 2024.

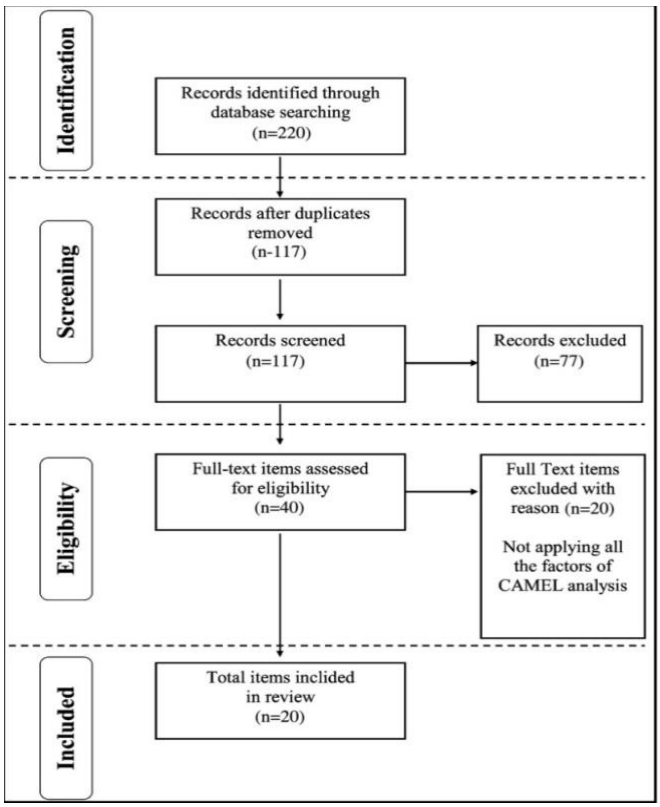

Figure 3: Flow Chart of PRISMA Model

Source: page et al. 2021

The searches were based on PRISMA Model as explained in figure 3. The period of search was, from 2010 to 2024. In all 20 research papers are identified with PRISMA Model, are reviewed in the following with a view to identify research gaps.

Sangmi and Nazir (2010) analyzed the performance of biggest nationalized bank (PNB) and biggest private sector bank (J&K Bank) using the CAMEL model for the period from 2001-2005. The analysis showed that both bank's position in terms of capital sufficiency; assets quality, managerial skill, and liquidity were solid and accurate. Prasad et al. (2011) evaluated the financial performance of the banking sector of all public sector banks and thirteen private sector banks in our country with the help of CAMEL model approach and the findings of the study have shown that Karur vysya bank was the best performer followed by Andhra bank and Bank of Baroda. It was also found that Central Bank of India hold last position and SBI got 36th position. Misra (2013) applied the CAMEL model to evaluate the overall performance and financial stability of a national financial institution. The findings showed that the institution's feature in terms of assets quality and capital adequacy may need to be improved.

Gupta (2014) analyzed the performance of public sector banks by using CAMEL Model for five years from 2009 to 2013 and brings out that Andhra Bank stood at high position followed by Bank of Baroda and United bank of India secured the last position. Mishra et al. (2015) evaluated the financial performance of public sector banks using CAMEL Model for five years from 2010 to 2014. This study attempts to measure the relative performance PNB and BOB. Meena and G.L (2016) examined the impact of CAMEL ratings on the performance of banks in India. The author explains how CAMEL ratings can be used to measure the financial health of banks and how this information can be used to improve their performance. Srinivasan and Saminathan (2016) applied CAMEL model to rank the public sector, private sector and foreign banks on the basis of financial performance from 2012 to 2014.They also find out that significant difference lies between the mean values of Camel ratios of public sector, private sector and foreign banks during the period of study.

Sharma and Sharma (2017) performed a comparative analysis of Profitability of Top Three Indian Private Sector Banks (HDFC, ICICI and AXIS Bank). This study is based on secondary data. This study reveals not much difference between these three private sector banks during the study. Kumar and Malhothra (2017) attempted has been made to evaluate the performance &financial soundness of selected private sector banks in India for the period 2007- 2017 CAMEL approach has been used. According to this research paper Axis Bank is ranked first by the CAMEL Model followed by ICICI Bank. Kotak Mahindra Bank scored the third position and IndusInd bank secured the last position amongst all the selected banks. Bothra and Purohit (2018) performed a comparative analysis of ICICI and SBI financial institutions using the CAMEL method, and the results showed that the ranking of ratios differs between ICICI and SBI. Further, SBI wants to strengthen its position with regard to control effectiveness, greater income generation, and liquidity, whereas ICICI Bank needs to improve its position with regard to capital sufficiency and asset fineness. Parikh (2018) studied the performance analysis of ICICI Bank, SBI, Bank of Baroda and HDFC Bank by using CAMEL Model. This study reveals the ICICI Bank was at top in terms of capital adequacy and SBI held the top rank in terms of remaining parameters. Balakrishnan (2019) studied the performance analysis of ICICI Bank by using CAMEL Model. This study reveals the ICICI Bank was in growing trend during the period of research.

Jha and Natarajan (2021) analyzed the financial performance of private sector banks and public sector banks for a period of 5 years 2015 – 2019 by using CAMEL Model. This article showed that the Public Sector Banks are not up to the marks as compare to Private Sector Bank. Kumar and Sinku (2021) analyzed the financial performance of SBI and ICICI for the period of pre- merger and post merger. CAMEL Model is used for the performance analysis. The results indicate that there is an improvement in the overall performance of the SBI and there is no significant improvement in the overall performance of ICICI Bank. Kumar (2022) analyzed the financial performance of private sector banks and public sector banks, by using CAMEL Model for a period of 7 years 2011-2018. The study was evident that, in India the private banks are better performers than the public banks. Reddy (2022) analyzed the financial performance of public sector banks and private sector banks (State Bank of India, Punjab National Bank, ICICI Bank and AXIS Bank) by using CAMEL Model. This study showed that the Public Sector Banks are not good as compare to Private Sector Banks. Kumar et al. (2022) analyzed the financial performance of a few select private banks and analyses them using the CAMEL Model. Based on CAMEL analysis, the rank order of the banks is ICICI Bank, HDFC Bank, Kotak Mahindra Bank, AXIS Bank, and YES Bank.

Soni and Devarakonda (2023) examined the financial performance of a few private sector banks, public sector banks and foreign banks by using the CAMEL Model and Panel data analysis. The most remarkable finding of this study is that Indian banks have performed reasonably well in terms of performance than foreign banks. Suresh and Pradhan (2023) examined the financial performance of selected Public sector undertaking banks and Private sector banks. The findings of the study show that PSUB has made a lot of progress but still are not performing up to the standard that PSB set. Goud and Chodisetty (2024) had taken total assets of 5 Public banks and 5 private banks. The findings of the study show that Kotak Mahindra outperformed all other banks and came out on top, while PNB came in last.

5. Results and Discussion

This section presents results with respect to factors responsible for bank's failure, CAMEL analysis of each bank & combined for all four banks.

5.1 Factors responsible for failure of a bank

This section represents the various factors that are responsible for failure of a commercial bank based on Systematic Literature Review. The main factors include excessive NPA, capital inadequacy, poor risk management, bank frauds etc. The details of factors and name of researchers who had identified there factors are presented in table 5.

Table 5: Factors Responsible for bank failure

Factors Responsible for bank failure	Sources
1. Excessive Non Performing assets/ Bad loans	Patra and Padhi (2016), Laila (2017), Kalra (2017), Aneja (2017), Vani (2020), Bamoriya and Jain (2013), ICGS (2016)
2. Capital Inadequacy	Jagtiani et al. (2014), Samad (2011), Lappay et al. (2021), Nguyen et al. (2018), Ishtiaq (2015).
3. Poor Risk Management	Kanchu and Kumar (2013), Murthy and Pathi (2013), Chitra and Gheetha (2020), Ubegbunan 2016, Benston and Kaufman, Alwarez and Restrepo (2016), Taiban and Tayachi (2021), Khanna & Arora (2009).
4. Bank Frauds and insider frauds	Singh et al. (2016), Thangam and Bhavin (2019), swain and Pani (2016), Momot and Rodchenko (2019), ICGS (2016), Khanna and Arora (2009).
5. Insider Abuse	Office of currency (1988), Marcinkowska (2012), Lakshan and Wijekoon (2012), Rao (2013), Gayathri (2015), Surapali and Parashari (2021).
6. Inadequate Liquidity	Bennett and Unal (2015), ubagbuban (2016), Fredrik et al. (2018), Momot and Rodchenko (2019), Raut (2022).

Source: Compiled by Author(s)

It is evident from the data presented in table 5 that all factors are almost given the same importance by the researchers. These factors were also responsible for failure of YES Bank and Lakshmi Vilas Bank (LVB). However in case of YES bank Insider Abuse was the main factor.

5.2 CAMEL Analysis of sample banks

This section presents CAMEL Analysis in two ways. Firstly, CAMEL Analysis of sampled banks (YES bank, SBI, LVB and DBIL) combined and secondly, CAMEL Analysis of individual banks.

5.2.1 CAMEL Analysis of sample banks in group

Table 6 shows the ratios and parameters provided under the CAMEL Model/ Framework are used in the current study to examine the overall performance of these banks.

Table 6: Financial Ratios with formula and their accepted bench mark values

Abbreviations	Names of Financial ratio	Formula	Source of data	Accepted Bench mark
Capital Adequacy (C)				
CAR (%)	Capital Adequacy Ratio	Equity Capital / Total Assets	Balance Sheet	9% (www.rbi.org.in)
T D/E	Total Debt to Equity Ratio	Debt/ Equity	Balance Sheet	15 or lower is good, (Sudha and Rajendran, 2019), (Kumar, 2020)
Assets Quality (A)				
NNR (%)	Net NPA Ratio	Net NPA / Total Advances	Balance Sheet	Below 1% is considered good. (www.rbi.org.in)
ROA (%)	Return on Assets	Net Profit / Total Assets	Balance Sheet, statement of Profit & loss	greater than 5% is considered good. (www.rbi.org.in)
Management Quality/ Risk (M)				
ADR	Advances to Deposits Ratio	Total Advances / Total Deposits	Balance Sheet	0.8 to 0.9 is considered good.
ROCE (%)	Return on Capital Employed	Profit before tax/ Capital Employed	Balance Sheet, statement of	ROCE 7.5 % or more is considered good.

			Profit & loss	(Kaur et al. 2015)
Earnings (E)				
BEPS	Basic Earnings Per Share (INR)	Net Income – Preferred Dividends/ weighted Average of Common Shares	Balance Sheet, statement of Profit & loss	Higher BEPS shows higher earnings. (Kumar, 2020)
I I / T A (%)	Interest Income to Total Assets	Net Interest Income/ Total Assets	Balance Sheet, statement of Profit & loss	A high ratio is a good indicator. (Shanmugam and Ravirajan, 2021)
N I I/ T A (%)	Non Interest Income to Total Assets	Other Income/ Total Assets	Balance Sheet, statement of Profit & loss	More than 0.75 is a good indicator.
Liquidity Ratio (L)				
CR	Current Ratio	Current Assets/ Current Liabilities	Balance Sheet	2 or more is good. (Sudha and Rajendran, 2019), (Kumar, 2020)
LAR	Liquid Assets to Total Assets Ratio	Liquid Assets/ Total Assets	Balance Sheet	1 and above is good. (Kumar, 2020), (Sudha and Rajendran, 2019)

5.2.1.1 Capital Adequacy (C)

Capital adequacy refers to overall financial condition of banks and also the ability of management to meet the needs of additional capital (Rauf, 2016). The analysis of Capital adequacy is based on two ratios i.e. CAR and T D/E. The computations are presented in table 7.

Table 7: Capital Adequacy (C) Parameters: CAR & T D/E

CAR (%)	Year	YES bank	SBI	LVB	DBIL
	2009	16.6	14.25	10.09	15.70
	2010	20.6	13.39	14.21	16.96
	2011	16.5	11.98	13.19	14.98
	2012	17.9	13.86	13.10	14.38
	2013	18.3	12.92	12.32	12.99
	2014	14.4	12.96	10.9	13.81
	2015	15.6	12.00	11.34	17.01
	2016	16.5	13.12	11.00	18.64
	2017	17.0	13.11	10.38	16.49
	2018	18.4	12.60	10	16.14
	2019	16.5	12.72	7.72	19.69
	2020	8.5	13.13	1.12	16.33
Average		16.4	13.01	10.45	16.09
Bench mark value of CAR for private commercial bank is 9% (rbi.org.in).					
T D/E	2009	13.10	15.64	15.40	0.12
	2010	10.78	14.97	14.1	8.49
	2011	14.55	17.83	13.9	12.20
	2012	14.74	14.90	19.0	12.77
	2013	16.06	14.84	16.4	12.89
	2014	14.9	14.15	18.6	10.32
	2015	13.8	14.94	14.87	8.60
	2016	10.4	18.72	14.83	8.93
	2017	8.5	12.55	15.13	8.65
	2018	10.7	14.00	16.03	9.23
	2019	12.49	15.00	15.96	8.77
	2020	10.09	15.32	18.05	9.42
Average		12.51	15.24	16.02	9.19
Bench mark value Total debt to equity is 15 or lower is good, more than 20 is bad.					

Combined Average		14.45	14.12	13.24	12.65
Rank		1	2	3	4

Source: Annual Reports of YES bank, SBI, Lakshmi Vilas Bank (LVB), DBS bank India ltd. (2009-2020), moneycontrol.com (YES bank, SBI, Lakshmi Vilas Bank (LVB)).

The higher CAR indicates the bank is able to protect value of investment of investors. All banks in the sample having a higher CAR than the benchmark level set by RBI i.e. 9% as of March 2019. It is found that YES bank secured highest Average CAR of 16.4% followed by DBIL with 16.09% and LVB stood at last with 10.45%. It is also found that DBIL secured the Average T D/E of 9.19 which is under the benchmark value i.e. lower than 15 (table 6) followed by YES bank with the value of 12.5. After computing the combined average, YES bank secured highest position followed by SBI and DBIL secured lowest position.

5.2.1.2 Assets Quality (A)

Asset quality determines the healthiness of financial institutions against loss of value in the assets as asset impairment risks the solvency of the financial institutions. The weakening value of assets has a negative effect, as losses are eventually written-off against capital, which expose the earning capacity of the institution, (Rauf 2016). The analysis of Asset quality is based on two ratios, i.e. NNR and ROA. The computations are presented in table 8.

Table 8: Assets quality (A) Parameters: NNR & ROA

NNR (%)		YES bank	SBI	LVB	DBIL
	2009	0.03	1.79	1.24	0.55
	2010	0.06	1.72	4.11	1.0
	2011	0.03	1.63	0.90	0.31
	2012	0.05	1.82	1.74	0.60
	2013	0.05	2.10	2.43	2.37
	2014	0.12	2.57	3.44	10.19
	2015	0.29	2.12	1.85	4.15
	2016	0.29	3.81	1.0	4.34
	2017	0.81	3.71	1.76	2.12
	2018	0.64	5.73	6.0	1.09
	2019	1.86	3.01	7.49	0.33
	2020	5.03	2.23	10.04	0.47
Average		0.77	2.69	3.50	2.29
Bench mark value of NNR is below 1% considered good.					
ROA (%)	2009	1.59	1.04	0.71	2.72
	2010	1.79	0.88	0.74	2.38
	2011	1.58	0.71	0.76	0.79
	2012	1.57	0.88	0.65	1.12
	2013	1.57	0.91	0.51	0.72
	2014	1.6	0.65	0.28	0.01
	2015	1.6	0.76	0.53	-0.71
	2016	1.7	0.46	0.62	0.02
	2017	1.8	0.41	0.72	0.03
	2018	1.6	-0.19	-1.44	-1.16
	2019	0.5	0.02	-2.70	0.04
	2020	-5.1	0.38	-3.42	0.20
Average		0.98	0.58	-0.17	0.51
Bench mark value of ROA is greater than 5% considered good.					
Combined Average		0.88	1.63	1.67	1.40
Rank		4	1	2	3

Source: Annual Reports of YES bank, SBI, Lakshmi Vilas Bank (LVB), DBS bank India ltd. (2009-2020), moneycontrol.com (YES bank, SBI, Lakshmi Vilas Bank (LVB)).

Table 8 revealed that YES Bank successfully managed its NPAs till 2018 but after that it increased excessively. In 2020 NNR of YES bank reached to the value of 5.03. LVB has higher average NNR with the value of 3.50 which shows poor Assets management of LVB. All banks in the sample have a lower ROA than the benchmark level set by RBI i.e. greater than 5%. It is found that LVB has lowest ROA with value of -0.17.

5.2.1.3 Management Risk (M)

Management efficiency is a key to judge the decision making capacity of managing board, as ingredients of the CAMEL Model. The ratio is to capture the possible subjective dynamics of the effectiveness of management, (Kumar and Sharma, 2014). The analysis of Management Risk is based on two ratios, i.e. ROCE and ADR. The computations are presented in table 9.

Table 9: Management Risk (M) Parameters: ROCE & ADR

ROCE (%)		YES bank	SBI	LVB	DBIL
	2009	5.70	6.4	6.0	4.2
	2010	6.16	5.4	6.1	3.8
	2011	6.93	4.5	6.2	1.01
	2012	5.18	5.5	6.9	1.9
	2013	4.86	5.3	6.1	1.4
	2014	5.68	3.6	4.0	0.01
	2015	5.29	3.9	6.5	-2.0
	2016	5.58	2.7	7.2	0.05
	2017	5.50	2.1	6.5	0.12
	2018	4.20	-1.1	-9.2	-4.0
	2019	1.27	0.14	-31.7	0.12
	2020	-12.1	2.6	-42	0.73
Average		3.69	3.42	-2.28	0.62
Bench mark value of ROCE is 7.5 % or more considered good.					
ADR	2009	0.77	0.73	0.72	0.45
	2010	0.83	0.73	0.75	0.48
	2011	0.75	0.79	0.73	1.02
	2012	0.77	0.83	0.72	0.99
	2013	0.70	0.87	0.75	0.89
	2014	0.75	0.87	0.69	0.86
	2015	0.83	0.83	0.74	0.91
	2016	0.88	0.85	0.77	0.75
	2017	0.93	0.77	0.78	0.81
	2018	1.01	0.72	0.77	0.61
	2019	1.06	0.75	0.69	0.54
	2020	11.62	0.72	0.64	0.54
Average		1.74	0.79	0.73	0.74
Bench mark value 0f ADR is 0.8 to 0.9 considered good.					
Average		2.72	2.10	-0.78	0.68
Rank		1	2	4	3

Source: Annual Reports of YES bank, SBI, Lakshmi Vilas Bank (LVB), DBS bank India ltd. (2009-2020), moneycontrol.com (YES bank, SBI, Lakshmi Vilas Bank (LVB)).

Table 9 reveals that no one bank in the sample has higher ROCE than benchmark level set by RBI i.e. 7.5% or more. It is found that average ROCE of YES bank is 3.69 followed by SBI and LVB stood at last with value of -2.28. ADR in table 9 reveals that, in 2020 YES bank had highest ADR with the value of 11.62 which is more than benchmark level set by RBI i.e. 0.8 to 0.9. YES Bank provides more advances than the prescribed value by RBI which shows poor management of YES bank and SBI is comparative good in Risk Management.

5.2.1.4 Earnings (E)

The quality of earnings is a very important criterion that determines the ability of a bank to earn consistently. It determines the profitability of bank and explains its growth in earnings in future (P.K. 2010). The analysis of Earnings are based on three ratios that are Basic EPS, Interest/ total assets and non interest/ total assets. The computations are presented in table 10.

Table 10: Earnings (E) Parameters: BEPS, I I/ T A & N I I/ T A

BEPS (INR)		YES bank	SBI	LVB	DBIL
	2009	10.24	143.77	10.31	---
	2010	15.65	135.23	4.95	---
	2011	21.12	130.16	10.37	---
	2012	27.87	184.31	10.97	---
	2013	36.53	210.06	9.39	---
	2014	44.92	15.68	6.11	---
	2015	49.34	17.55	9.16	---
	2016	12.1	12.98	10.05	---
	2017	15.8	13.43	14.07	---
	2018	18.4	-7.67	-28.29	---
	2019	7.4	0.97	-34.66	2.41
	2020	-56.1	16.23	-25.16	1.76
Average		16.94	72.73	-0.23	2.09
Bench mark value, Higher EPS shows higher earnings					
I I/ T A (%)	2009	8.74	6.92	8.91	0.06
	2010	6.51	6.71	8.02	0.06
	2011	6.84	6.65	8.00	0.05
	2012	8.56	7.97	9.35	0.05
	2013	8.36	7.63	9.96	0.06
	2014	9.15	7.60	9.60	0.06
	2015	8.49	7.44	8.96	0.07
	2016	8.18	6.95	8.93	0.05
	2017	7.63	6.48	8.07	0.06
	2018	6.48	6.38	7.52	0.05
	2019	7.77	6.59	8.59	0.05
	2020	10.11	6.51	9.03	0.05
Average		8.07	6.99	8.75	0.06
Bench mark value, A high ratio is a good indicator.					
N I I/ T A (%)	2009	1.91	1.3	1.06	2.4
	2010	1.58	1.4	1.05	0.97
	2011	1.05	1.3	1.03	0.40
	2012	1.16	1.1	0.97	0.85
	2013	1.27	1.02	1.11	0.32
	2014	1.57	1.03	1.05	0.56
	2015	1.50	1.10	1.14	0.63
	2016	1.64	1.3	1.05	0.63
	2017	1.96	1.3	1.4	1.3
	2018	1.69	1.3	0.85	0.63
	2019	1.20	0.99	0.75	0.15
	2020	4.59	1.1	1.4	0.44
Average		1.76	1.19	1.07	0.84
Bench mark value, A low ratio is a good indicator.					
Combined Average		8.92	26.96	3.19	0.99
Rank		2	1	3	4

Source: Annual Reports of YES bank, SBI, Lakshmi Vilas Bank (LVB), DBS bank India ltd. (2009-2020), moneycontrol.com (YES bank, SBI, Lakshmi Vilas Bank (LVB))

Table 10 reveals that BEPS of YES bank and LVB shows negative balance in 2020. SBI secured highest average BEPS with value of 72.73 and LVB secured lowest average BEPS with the value of -0.23. I I/ T A of DBIL secured lowest value with 0.06. This shows that DBIL has less reliance on interest from bank lending as a source

of funding. In 2020, YES bank secured highest N I I/ T A with the value of 4.59. This shows that YES bank has more reliance on non interest income as a source of funding.

5.2.1.5 Liquidity (L)

Risk of liquidity is curse to the image of bank. Bank has to take a proper care to hedge the liquidity risk and ensuring good percentage of funds are invested in high return generating securities, so that it is in a position to generate profit with provision liquidity to the depositors. The analysis of Liquidity is based on two ratios i.e. CR and LAR. The computations are presented in table 11.

Table 11: Liquidity (L) Parameters: CR & LAR

CR		YES bank	SBI	LVB	DBIL
	2009	0.89	0.83	0.84	0.74
	2010	0.91	0.86	0.81	0.66
	2011	0.83	0.89	0.82	1.19
	2012	0.83	0.90	0.79	1.14
	2013	0.77	0.93	0.81	1.07
	2014	0.84	0.93	0.77	1.02
	2015	0.91	0.90	0.81	1.01
	2016	0.97	0.93	0.83	1.01
	2017	1.06	0.86	0.84	1.00
	2018	1.01	0.82	0.86	0.86
	2019	1.18	0.88	0.80	0.89
	2020	1.74	0.84	0.83	0.82
Average		0.99	0.88	0.82	0.95
Bench mark value of CR is 2 and above considered good.					
LAR	2009	0.63	0.67	0.69	0.35
	2010	0.68	0.69	0.67	0.33
	2011	0.64	0.72	0.69	0.39
	2012	0.56	0.72	0.68	0.41
	2013	0.52	0.74	0.71	0.40
	2014	0.56	0.75	0.69	0.38
	2015	0.61	0.72	0.72	0.47
	2016	0.64	0.72	0.73	0.52
	2017	0.71	0.64	0.72	0.60
	2018	0.58	0.62	0.69	0.51
	2019	0.70	0.65	0.67	0.50
	2020	0.69	0.63	0.64	0.42
Average		0.63	0.69	0.69	0.44
Bench mark value of LAR is 1 and above considered good.					
Combined Average		0.81	0.78	0.75	0.69
Rank		1	2	3	4

Source: Annual Reports of YES bank, SBI, Lakshmi Vilas Bank (LVB), DBS bank India ltd. (2009-2020), money control. com (YES bank, SBI, Lakshmi Vilas Bank (LVB))

Table 11 reveals that all banks in the sample have lower CR and LAR than its benchmark value (table 6). LVB secured lowest CR with the value of 0.82. This shows that LVB secured less liquidity as compared to other banks in sample and YES bank secured the highest CR with the average value of 0.99. SBI and LVB have same LAR with the average value of 0.69 and DBIL has secured lowest LAR with the value of 0.44.

5.2.2 CAMEL Analysis of each bank (YES bank, SBI, LVB, DBIL)

This section presents the analysis of financial performance, based on CAMEL model for the YES bank, SBI, LVB, and DBIL. The analyses are presented in the table 12a, 12b, 12c and 12d. The basic objective as mentioned above is to ascertain the sustainability of these banks in the long run.

Table 12a: CAMEL Analysis of YES Bank

YES bank	C		A		M		E			L	
	CAR	T D/E	NNR	ROA	ROCE	ADR	BEPS	I I/ T A	N I I/ T A	CR	LAR
2009	16.6	13.10	0.03	1.59	5.70	0.77	10.24	8.74	1.91	0.89	0.63
2010	20.6	10.78	0.06	1.79	6.16	0.83	15.65	6.51	1.58	0.91	0.68
2011	16.5	14.55	0.03	1.58	6.93	0.75	21.12	6.84	1.05	0.83	0.64
2012	17.9	14.74	0.05	1.57	5.18	0.77	27.87	8.56	1.16	0.83	0.56
2013	18.3	16.06	0.05	1.57	4.86	0.70	36.53	8.36	1.27	0.77	0.52
2014	14.4	14.9	0.12	1.6	5.68	0.75	44.92	9.15	1.57	0.84	0.56
2015	15.6	13.8	0.29	1.6	5.29	0.83	49.34	8.49	1.50	0.91	0.61
2016	16.5	10.4	0.29	1.7	5.58	0.88	12.1	8.18	1.64	0.97	0.64
2017	17.0	8.5	0.81	1.8	5.50	0.93	15.8	7.63	1.96	1.06	0.71
2018	18.4	10.7	0.64	1.6	4.20	1.01	18.4	6.48	1.69	1.01	0.58
2019	16.5	12.49	1.86	0.5	1.27	1.06	7.4	7.77	1.20	1.18	0.70
2020	8.5	10.09	5.03	-5.1	-12.1	11.62	-56.1	10.11	4.59	1.74	0.69
Mean	16.34	12.51	0.77	0.98	3.69	1.74	16.94	8.07	1.76	0.99	0.63
Sd	2.94	1.88	1.44	1.95	5.16	3.11	26.72	1.09	0.94	0.26	0.06

Based on analysis presented in table 12a, it is inferred that CAR of YES bank increased in starting years but later it decreased excessively and reached to the value of 8.5 in 2020. Average CAR value is 16.34% which is greater than benchmark value (9%, Table 6), indicates that capital requirement of YES Bank is adequate. The second parameter that is T D/E, fluctuated during the 2009- 2020. NNR is good till 2018 but after that it is increased at a high speed and reached to the value of 5.03 which is greater than benchmark value (less than 1%, table 6). It leads to decrease in the Assets Quality of the YES bank. BEPS shows the mean value of 16.94 and has s.d. value which is 26.72. Decreasing BEPS is bad indicator for the bank. CR is fluctuating during 2009- 2020. LAR shows the mean value 0.63 which is less than the benchmark value (table 6) and having s.d. value which is 0.06. The value of LAR, below 1 may indicate financial difficulty.

Table 12b: CAMEL Analysis of SBI

SBI	C		A		M		E			L	
	CAR	T D/E	Net NPA	ROA	ROCE	ADR	BEPS	I I/ T A	N I I/ T A	CR	LAR
2009	14.25	15.64	1.79	1.04	6.4	0.73	143.77	6.92	1.3	0.83	0.67
2010	13.39	14.97	1.72	0.88	5.4	0.73	135.23	6.71	1.4	0.86	0.69
2011	11.98	17.83	1.63	0.71	4.5	0.79	130.16	6.65	1.3	0.89	0.72
2012	13.86	14.90	1.82	0.88	5.5	0.83	184.31	7.97	1.1	0.90	0.72
2013	12.92	14.84	2.10	0.91	5.3	0.87	210.06	7.63	1.02	0.93	0.74
2014	12.96	14.15	2.57	0.65	3.6	0.87	15.68	7.60	1.03	0.93	0.75
2015	12.00	14.94	2.12	0.76	3.9	0.83	17.55	7.44	1.10	0.90	0.72
2016	13.12	18.72	3.81	0.46	2.7	0.85	12.98	6.95	1.3	0.93	0.72
2017	13.11	12.55	3.71	0.41	2.1	0.77	13.43	6.48	1.3	0.86	0.64
2018	12.60	14.00	5.73	-0.19	-1.1	0.72	-7.67	6.38	1.3	0.82	0.62
2019	12.72	15.00	3.01	0.02	0.14	0.75	0.97	6.59	0.99	0.88	0.65
2020	13.13	15.32	2.23	0.38	2.6	0.72	16.23	6.51	1.1	0.84	0.63
Mean	13.01	15.24	2.69	0.58	3.42	0.79	72.73	6.99	1.19	0.99	0.63
Sd	0.26	1.64	1.21	0.37	2.26	0.06	80.76	0.54	0.14	0.04	0.05

Based on analysis presented in table 12b, it is inferred that CAR of SBI was good during 2009-2020. Average CAR value is 13.01% which is greater than benchmark value (9%, Table 6) indicating that Capital requirement of SBI was adequate. The second parameter that is T D/E, is fluctuating during the 2009- 2020 but overall it is good. Net NPA is continuously increasing till 2018 and after that it is decreasing but overall NNR is more than benchmark value. It leads to decrease the Assets Quality of the bank. BEPS is fluctuating during 2009- 2020. Decreasing BEPS is bad indicator for the bank. This ratio shows the mean value 72.73 and having s.d. value

which is 80.76. CR was low in 2018 with 0.82 and LAR shows the mean value 0.63 and having s.d. value which is 0.05.

Table 12c: CAMEL Analysis of LVB Bank

LVB	C		A		M		E			L	
	CAR	T D/E	Net NPA	ROA	ROCE	ADR	BEPS	I I/ T A	N I I/ T A	CR	LAR
2009	10.09	15.40	1.24	0.71	6.0	0.72	10.31	8.91	1.06	0.84	0.69
2010	14.21	14.1	4.11	0.74	6.1	0.75	4.95	8.02	1.05	0.81	0.67
2011	13.19	13.9	0.90	0.76	6.2	0.73	10.37	8.00	1.03	0.82	0.69
2012	13.10	19.0	1.74	0.65	6.9	0.72	10.97	9.35	0.97	0.79	0.68
2013	12.32	16.4	2.43	0.51	6.1	0.75	9.39	9.96	1.11	0.81	0.71
2014	10.9	18.6	3.44	0.28	4.0	0.69	6.11	9.60	1.05	0.77	0.69
2015	11.34	14.87	1.85	0.53	6.5	0.74	9.16	8.96	1.14	0.81	0.72
2016	11.00	14.83	1.0	0.62	7.2	0.77	10.05	8.93	1.05	0.83	0.73
2017	10.38	15.13	1.76	0.72	6.5	0.78	14.07	8.07	1.4	0.84	0.72
2018	10	16.03	6.0	-1.44	-9.2	0.77	-28.29	7.52	0.85	0.86	0.69
2019	7.72	15.96	7.49	-2.70	-31.7	0.69	-34.66	8.59	0.75	0.80	0.67
2020	1.12	18.05	10.04	-3.42	-42	0.64	-25.16	9.03	1.4	0.83	0.64
Mean	10.44	16.02	3.50	-0.17	-2.43	0.73	-0.23	8.75	1.07	0.82	0.69
Sd	3.42	1.70	2.91	1.49	16.82	0.04	17.84	0.73	0.19	0.02	0.03

Based on analysis presented in table 12c, it is inferred that CAR is good till 2018 after that it decreases excessively. In 2020 this ratio was 1.12% which was less than the benchmark value (9%, Table 6). The second parameter that is T D/E which fluctuatedfrom 2009- 2020 but overall it is good. Net NPA is not good during the 2009- 2020. Average NNR is 3.5% which is greater than benchmark value (below 1%, Table 6) indicating that bank has poor Assets Quality. Both ROA and ROCE are bad but in 2018 it becomes in minus figures. In 2020 ROA was low with the value of -0.34% and in 2020 ROCE is low with -42%, indicating that LVB has more risk. The next parameter that is BEPS which was not good during 2009- 2020. This ratio shows the mean value which is -0.23 which was less than the benchmark value. Negative BEPS is bad indicator for the bank. CR and LAR is fluctuating during the 2009-2020. In 2016 this ratio was high with the value of 0.73 and the mean value is 0.69 and s.d. value is 0.02.

Table 12d: CAMEL Analysis of DBIL

DIBIL	C		A		M		E			L	
	CAR	T D/E	Net NPA	ROA	ROCE	ADR	BEPS	I I/ T A	N I I/ T A	CR	LAR
2009	15.70	0.12	0.55	2.72	4.2	0.45	--	0.06	2.4	0.74	0.35
2010	16.96	8.49	1.0	2.38	3.8	0.48	--	0.06	0.97	0.66	0.33
2011	14.98	12.20	0.31	0.79	1.01	1.02	--	0.05	0.40	1.19	0.39
2012	14.38	12.77	0.60	1.12	1.9	0.99	--	0.05	0.85	1.14	0.41
2013	12.99	12.89	2.37	0.72	1.4	0.89	--	0.06	0.32	1.07	0.40
2014	13.81	10.32	10.19	0.01	0.01	0.86	--	0.06	0.56	1.02	0.38
2015	17.01	8.60	4.15	-0.71	-2.0	0.91	--	0.07	0.63	1.01	0.47
2016	18.64	8.93	4.34	0.02	0.05	0.75	--	0.05	0.63	1.01	0.52
2017	16.49	8.65	2.12	0.03	0.12	0.81	--	0.06	1.3	1.00	0.60
2018	16.14	9.23	1.09	-1.16	-4.0	0.61	--	0.05	0.63	0.86	0.51
2019	19.69	8.77	0.33	0.04	0.12	0.54	2.41	0.05	0.15	0.89	0.50
2020	16.33	9.42	0.47	0.20	0.73	0.54	1.76	0.05	0.44	0.82	0.42
Mean	16.09	9.20	2.29	0.51	0.61	0.74	2.09	0.06	0.84	0.95	0.44
Sd	1.92	3.31	2.86	1.14	2.23	0.20	0.46	0.01	0.60	0.16	0.08

Based on analysis presented in table 12d, it is inferred that CAR of DBIL was good during the 2009-2020. In 2019 this ratio is high with 19.69%. Average CAR value is 16.09%, which is greater than benchmark value (9%, Table 6) indicating that DBIL CAR is adequate. The second parameter that is T D/E has a mean value of

9.199 which is under the benchmark value (less than 15, Table 6). NNR is not good during the 2013-2018. In 2014 it was high with the value of 10.19%. Average NNR value is 2.29%, which is greater than benchmark value (Less than 1%, Table 6) indicates that DBIL Net NPA is not good. The next parameter that is ROA has a mean value of 0.513 which is less than benchmark. It leads to decrease the Assets Quality of the bank. ROA is bad but in 2015 it becomes in minus figures. In 2018 ROA is low with -1.16%.

ADR is in increasing trend till 2017 and in 2020 this ratio is low with 0.54. This ratio shows the mean value 0.06 which is less than the benchmark value. The next parameter that is CR is in increasing trend till 2011 and after that it was decreasing. LAR is also fluctuating during the study but overall performance is good. In 2016 this ratio is high with 0.73. This ratio shows the mean value 0.44 and having s.d. value which is 0.08.

6. Conclusion

Failure of any bank or a financial institution is considered as an economic breakdown for the economy of a country. Banks' failure is a major concern to the economy all over the world, as it affects individual bank in terms of direct and indirect costs. Direct cost will be in terms of legal and administration cost associated with bankruptcy proceedings and Indirect cost will be in terms of loss of depositor's confidence, withdrawal of amount from the bank, by customers, avoidance of investment by financial institutions (Kumar and Suhas, 2010). The knowledge of financial performance helps in predicting, comparing and evaluating the earning ability of the company. This paper makes an attempt to examine and compare the performance of the sample banks i.e. YES bank, SBI, LVB, DBIL. The analysis is based on the CAMEL model. This Paper has brought many interesting results, some of which are mentioned as below.

CAR explains the relation between bank capital and its risk weighted assets. YES bank had appropriate capital adequacy ratio till 2019 which is more than bench mark value (9%) but in 2020 it falls down to 8.5%. T D/E ratio of YES bank found to be appropriate according to the benchmark value, i.e. less than 15%, during the study. In the starting years of this study NNR of YES bank is 0.03% which is less than the bench mark value (less than 1%) but in 2020 this ratio reached up to the value of 5.1%. ROA ratio of YES bank found to be less than the benchmark value (greater than 5%) during the study. YES bank showed a consistency in the value of ROA ratio till 2018 but after that it goes down and in 2020 its value is -5.1% which is less than benchmark value. During the study, value of ROCE ratio of YES bank found to be less than the benchmark value (7.5% or more) and in 2020 its value was -12.1% which shows the company' poor profitability and poor capital efficiency. During the study, YES bank had appropriate value of ADR ratio till 2017 but after that it grows up and reached up to the value of 11.62 which is not good. Basic EPS value of YES bank showed an increasing trend up to 2015 and after that it decreases and in 2020 the value was -56.1. The value of Non – Interest to Total Assets ratio was 1.91 in 2009 and after that it shown a decreasing trend up to 2013 and after that its value was increased and reached up to the value of 4.59%. The higher value indicated that bank rely on non interest source of fund. The value of CR of YES bank showed an increasing trend from 2013 and in 2020 its value was 1.74 which was less than the benchmark value (2:1). The average value of LAR of YES bank was 0.63 which was less than the benchmark value (1 and above) and this value indicates the financial difficulty.

LVB had appropriate capital adequacy ratio till 2013 which is more than bench mark value (9%) but after that this ratio decreases and in 2020 it becomes 1.12%. T D/E ratio of LVB found to be under the benchmark value till 2011 and after that it increased up to 18% in 2020. During the study, NNR of LVB found to be more than the benchmark value (less than 1%) and in 2020 it reached to 10.04%. ROA ratio of LVB found to be less than the benchmark value (greater than 5%) during the study. In the starting years of study the value of ROA had a consistent value near about 0.6 till 2017 but after that the value of ROA was decreases and reached up to -3.42%. Value of ROCE ratio found to be less than the benchmark value (7.5% or more) during the study period. The value of ROCE was 6.0 in 2009 and in 2018 its value was -9.2 and goes down to -42 in 2020. It was found that value of ADR is under the benchmark value (0.8% to 0.9%). Basic EPS value of LVB in 2017 was 14.07 and in 2020 its value was -25.16. The average value of Interest Income to Total Assets ratio was 8.74 % and the average value of non Interest income to total assets ratio was 1.071%. These values showed that bank rely on interest source of fund. The average value of CR of LVB was 0.8175 which was less than the benchmark value

(2:1). The average value of LAR of LVB was 0.69 which was less than the benchmark value (1 and above). The value of below 1 indicates financial difficulty. From the above facts, it can be concluded that CAMEL Analysis is a good method to predict failure of a bank. One of the most important conclusions is that when a bank cannot reverse the value of CAMEL parameters, it is bound to be fail.

The banking industry relies on trust. Therefore, there should be transparency in the banking industry in order to safeguard the interests of investors, depositors, and consumers. Banks must improve their processes of giving credit to customers, credit risk monitoring system and assets quality. Banks should do proper internal assessment of capital adequacy at a regular interval to avoid the situation of YES bank and LVB. Mortgage lending is inspected by experienced valuers or experts only. Banks should take strong legal actions against loan defaulters and workings of a bank should not be affected by political interventions. Banks should decrease their NPA by adopting various measures within the constraints of RBI guidelines and Banks should not provide more unsecured loans. To boost its liquidity, the bank should work to attract additional deposits and have the appropriate level of liquid assets.

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Intellectual Property Commercialization in the Creative Industry: An Integrative Literature Review

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Abstract
This study aims to develop a comprehensive understanding of intellectual property (IP) commercialization in the creative industry, highlighting its essential role in the growth of the sector. 16 relevant articles were analyzed, resulting in the development of a four-phase model of IP commercialization: ideation, development, creation, and commercialization. These phases are combined with the concept of creativity-based innovation specific to the creative industry to form an integrative framework. Each phase emphasizes the interaction between divergent thinking and sequential processes in the commercialization journey while highlighting the central role of creativity at each stage. The findings of this study contribute to the academic discourse and provide practical guidance for practitioners, policymakers, and stakeholders in developing IP commercialization strategies in the creative industry.

Keywords: Creative Industry, Creativity, Intellectual Property, Commercialization, Literature Review

1. Introduction

The creative economy emerged at the end of the 20th century and has placed the creative industry as one of the main pillars of global economic growth (Turgel et al., 2022). The essence of the creative economy is the fusion of creativity with intellectual property (IP) rights. This concept emphasizes individual creativity and the exploitation of IP to create products (Mazilu et al., 2020). Unlike other industries, the creative industry values artistic aspirations (Loots & van Bennekom, 2022). However, creativity alone does not guarantee success, making commercialization a significant challenge in the industry (Permatasari et al., 2021).

IP, as defined by the World Intellectual Property Organization (WIPO), is an intangible asset that results from human creation, such as inventions, creative works, designs, symbols, and names (WIPO, 2023b), including innovative ideas, creativity, and other intangible assets (Chiwuta, 2020). For the creative industry, the development and utilization of IP have become essential for its success (Boğa & Topcu, 2020; Gerosa, 2022). In this instance, IP in the creative industry could offer protection and give identity as well as value to its products (Chandra &

Liaqat, 2019). The role of IP in the creative industry may differ from other industries because their products rely heavily on personal IP and other creative resources (Erickson, 2018; Gerosa, 2022).

From its market perspective, the current global market offers vast opportunities to commercialize IP assets in the creative industry. In recent decades, IP utilization through commercialization has experienced significant growth, with IP marketing and trading becoming a primary source of revenue for many creative workers. One of the prospective revenues is through licensing (Pinho & Pinho, 2019). Licensing Expo China confirmed this growth by recording a 3.2% YoY increase in global retail sales of licensed goods and services in 2018, reaching USD 280.3 billion (Licensing Expo China, 2019). IP commercialization activities have led many major brands to success, such as Disney, Star Wars, and Marvel by expanding their IP characters across platforms (Bellido & Bowrey, 2018; Buoye et al., 2020). This potential has been realized at the international level, contributing to the expansion of the global IP ecosystem. This progress is evidenced by the holding of events such as the World Licensing Expo and the establishment of organizations focused on IP development, including WIPO (Global Licensing Group, 2023; WIPO, 2023a).

From the academic standpoint, numerous studies have explored diverse dimensions of IP strategy within a broad context. AlGhamdi & Durugbo (2021) conducted a study of IP management systems, covering aspects ranging from litigation and filing to co-creation and governance. In another study, Grimaldi et al. (2021) divided IP strategies into three categories, which are defensive, collaborative, and impromptu, highlighting the advantages and disadvantages of each and how their application varies depending on owners. In the commercialization area, Pererva & Maslak (2022) studied the stages of IP commercialization specifically for industrial enterprises. Furthermore, Boudreau et al. (2022) emphasized that the commercialization process cannot be separated from its protection mechanism. Regarding the context in the creative industry, Alexandri et al. (2020) highlighted that IP becomes an essential indicator in forming a creative ecosystem that involves various interactive elements, from creative policies to economic contributions. Moreover, Mareta (2022) studied that IP registration can drive economic growth.

Despite these research advances, there is still a lack of research on IP commercialization, particularly in terms of strategy to commercialize IP within the creative industry. This suggests an opportunity for academics and practitioners to complement the understanding of the potential and challenges of IP commercialization in the creative industry. The current study is therefore necessary for several reasons. Firstly, the creative industry depends on the application of individual IP (Gerosa, 2022) through creativity, skills, and talents (Mayasari & Chandra, 2020). Given the reliance of the creative industry on these unique attributes, it is imperative to investigate how the process of creativity leads to innovation that can be commercialized. This underscores the need for a specialized IP commercialization framework, tailored to leverage and translate the unique processes of the creative industry into commercial success. Secondly, the creative industry also covers various aspects, including human resources, knowledge, concepts, brands, and other intangible creative assets (Chiwuta, 2020). Therefore, it can be concluded that IP is the core of the industry and enhances the potential and value of creations through concept, originality, and expression (Chandra & Liaqat, 2019). In this context, it is essential to understand and integrate the creative processes that lead to these innovative IPs. Hence, the framework for IP commercialization in the creative industry must focus on how creativity translates into marketable and profitable innovations. Thirdly, the creative industry is at the heart of the concept of the creative economy, where the idea is to generate revenue (Salder, 2021). It involves the transformation of ideas into IP-based goods and services, driven primarily by human creativity (González & Molina, 2022). Expanding on this, Turgel et al. (2022) characterize the products of the creative industry as IP objects. In line with this, IP is described as intangible assets derived from human creativity, which can manifest in both tangible and intangible forms (WIPO, 2023b). Given this landscape, a deeper understanding of the creativity-based IP commercialization process in the creative industry becomes essential.

Therefore, this study aims to conceptualize and tailor the framework of IP commercialization in the creative industry that lies in the creativity aspect within the academic literature. To address this objective, an integrative literature review is conducted. In this instance, the body of knowledge of IP commercialization is integrated with concepts of creativity that drive innovation and foster commercialization. This study contributes to the theory development of IP commercialization, particularly in the context of the creative industry, by focusing on the

creative processes that give rise to commercialization. These findings also have implications for practitioners, policymakers, and stakeholders by providing a better understanding and approach to IP protection, management, and monetization in the creative industry.

2. Methods

2.1 Research Design

This study was conducted by an integrative review method based on Whittemore & Knafl (2005) to provide a broader examination of a phenomenon. Adapting this method allowed us to effectively define concepts, test theories, and review evidence for the study, drawing from various data sources to reach comprehensive conclusions (Sattar et al., 2023).

The primary study lies in creativity-based IP commercialization for the creative industry. However, this relationship has not been widely explored or discussed in academic literature. To address this limitation and ensure the review's robustness, the authors employed Spieth et al.'s (2023) blending and merging strategy that integrates multiple studies to completely synthesize the literature on IP commercialization and the creativity-based innovation of the creative industry. This approach aims to bridge the gap between these topics.

The methodology involves two main steps: firstly, the authors systematically reviewed the IP commercialization literature to identify overlaps and synergies (blending). A systematic approach is taken to anticipate errors and misinterpretation of data that may occur at any stage (Whittemore & Knafl, 2005). Secondly, the authors integrated the IP commercialization literature framework with creativity-based innovation in the creative industry (merging). Finally, an integrative framework is generated by combining insights from the blending and merging processes to propose a specialized framework for IP commercialization in the creative industry.

2.2 Literature Search

The authors obtained data from Scopus, one of the world's most eligible bibliographic databases, to ensure its credibility and reliability. During the article selection process, the primary focus revolved around the keywords "intellectual property" and "commercialization." The authors also expanded the results using "IP" in the search string. However, since "IP" and "intellectual property" are more or less the same, the authors must contain an OR statement between them. By focusing on these keywords, the authors aimed to capture a wide range of articles that addressed the link between IP and commercialization. Therefore, the search string used is as follows:

("intellectual property" OR "IP") AND commercialization

2.3 Inclusion and Exclusion

In order to maximize the results, the authors carried out inclusion and exclusion criteria in the search process (Turnbull et al., 2023). The authors also combined it with Mashalah et al.'s (2022) method by defining the search process into four stages: identification, screening, eligibility, and inclusion.

Based on the titles, abstracts, and keyword search results from the Scopus database, this initial systematic literature review yielded 1385 articles. Then, the authors used the filter limitations of English articles, within the scope of business and management subjects, and the time range of the past ten years. The authors also limited the articles to journal articles. Articles without these criteria were excluded, which resulted in 151 articles. Furthermore, the authors screened through the selected articles and filtered down to 16 articles that contributed to the IP commercialization framework that is eligible for further analysis. The article selection procedure is illustrated in Figure 1.

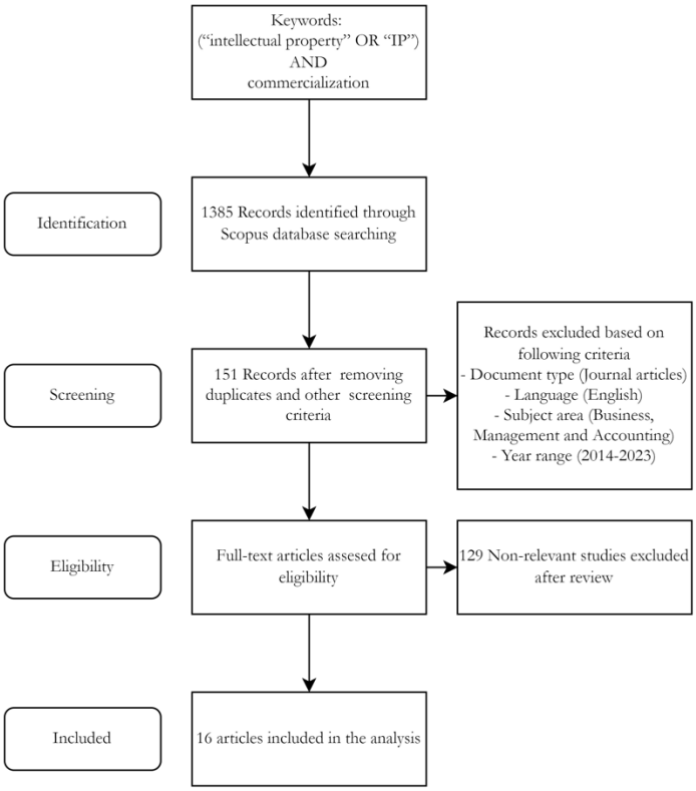

Figure 1: Article selection

2.4 Statistical Description and Analysis

This section provides descriptive statistics for the reviewed literature. Figure 2 illustrates the distribution of publications from 2014 to 2023. The number of publications remains constant each year. However, there has been an increase in publications on this topic in 2022, and there is a possibility that this trend will continue.

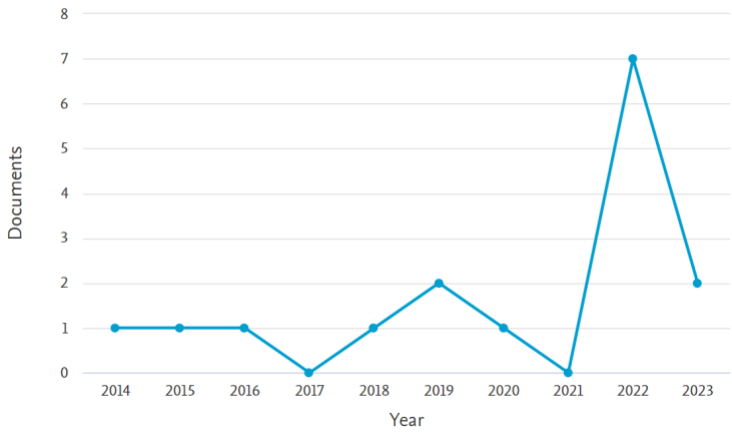

Figure 2: Publications by year

In addition, Table 1 presents publication data by journals. Few conclusions can be drawn as all the articles are from different journals. While the initial search applied business and management filters, the topics covered in these journals intersect with other subjects such as technology, innovation, and engineering. Although several journals have scope related to the creative industry (e.g., business, management, innovation, marketing, etc), none of the chosen articles explore this area.

Table 1: Number of publications by journals

Journal	Count
IEEE Transactions on Engineering Management	1
International Journal of Technology Marketing	1
Journal of Science and Technology	1
Science and Innovation	1
Problems and Perspectives in Management	1
Scientific Innovation	1
Journal of Science and Technology Policy Management	1
Eastern-European Journal of Enterprise Technologies	1
Small Business Economics	1
Inzinerine Ekonomika-Engineering Economics	1
Journal of Cleaner Production	1
European Research Studies Journal	1
Academic Journal of Interdisciplinary Studies	1
Journal of Innovation and Entrepreneurship	1
International Journal of Technology Management	1
Research Policy	1

Furthermore, according to Figure 3, most articles utilize qualitative methods, while only two publications implement quantitative methods, five employ a mixed methodology, and one utilizes a literature review. Due to the lack of quantitative research, any conclusions drawn from this study using constructs or variables found in the literature are difficult to make. Hence, the data analysis is referred to Sattar et al. (2023). Relevant texts in the articles related to IP commercialization mechanisms were sorted into codes. These codes were then grouped into sub-categories and combined into categories based on their relationships. In addition, the data extracted was included for further analysis. The study is then followed by an integrative review to gain more comprehensive results.

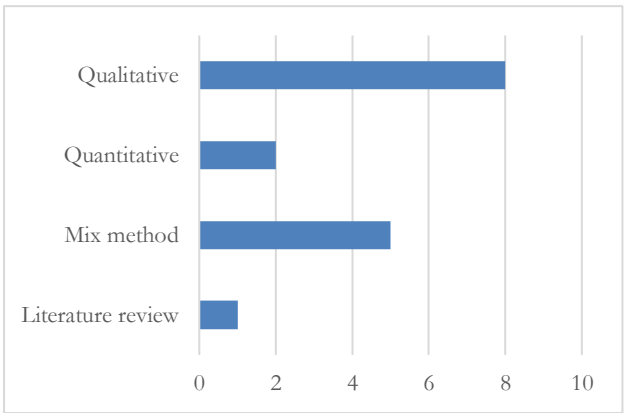

Figure 3: Methods used in the publications

3. Findings and Discussion

3.1 Blending the Knowledge Base on IP Commercialization Phases

This study began by gathering literature that provided a basic understanding of IP commercialization as a mechanism. After an extensive literature review, the authors identified some key findings that showed significant similarities and categorized them into distinct codes. This step was followed by axial coding, in which the authors systematically grouped and related these codes into sub-categories. These sub-categories were then organized into four main categories of phases in IP commercialization: ideation, development, creation, and commercialization (Table 2).

Table 2: Key findings categorization

Codes	**Sources**	**Sub-Category**	**Category**
IP awareness enhancement, IP knowledge enrichment, IP education , IP skillset, Identification, IP diagnostics, IP definition	(Ravi & Janodia, 2022); (Hayter & Link, 2022), (Mets et al., 2016), (Maslak & Pererva, 2023), (Damij et al., 2022), (Kodynetz & Maidanyk, 2019), (Pererva & Maslak, 2022)	Identification	Ideation
Innovation, Idea generation	(Kruachottikul et al., 2023), (Park & Kang, 2015)	Idea generation	
Research, Product development	(Deshpande & Nagendra, 2020), (Tsybulev, 2014), (Maslak & Pererva, 2023), (Mets et al., 2016), (Kusmintarti et al., 2022), (Kruachottikul et al., 2023), (Vimalnath et al., 2022), (Park & Kang, 2015)	R&D	Development
Legal protection, Registration, IP rights	(Kodynetz & Maidanyk, 2019), (Maslak & Pererva, 2023), (Kusmintarti et al., 2022)	Protection & legal consideration	
Test and validation	(Kruachottikul et al., 2023)	Testing & validation	Creation
Launch, Production	(Kruachottikul et al., 2023), (Tsybulev, 2014), (Park & Kang, 2015)	Product launch	
Marketing, Market analysis, Market segmentation, Market potential	(Tsybulev, 2014), (Pererva & Maslak, 2022), (Kodynetz & Maidanyk, 2019)	Marketing	Commercialization
Alliances, Collaboration, Cooperation, Partnership	(Oduro, 2019), (Mets et al., 2016), (Shatkovskaya et al., 2018), (Kusmintarti et al., 2022), (Rotolo et al., 2022)	Collaboration	
Diffusion	(Vimalnath et al., 2022)	Diffusion	
Scale-up	(Kruachottikul et al., 2023)	Scaling up	
Building reputation	(Rotolo et al., 2022)	Reputation building	

3.2 Merging the Concepts of Creativity-Based Innovation

3.2.1 Creativity-Based Innovation

Adopting an IP commercialization framework in the creative industry requires a thorough examination of the creative processes that give rise to the innovation capability for commercialization. This is particularly important in the context of the creative industry, where IP creation is inherently tied to the creative process.

The creative industry stems from the individual's creativity, skills, and talents (Mayasari & Chandra, 2020). Among these three, creativity is considered to be the main value of this industry (Carvalho & Cruz, 2017). In addition, it is mentioned that the creative industry uses creativity as the primary resource to create economic value (Howkins, 2013; Jatmiko et al., 2022). In practice, this industry covers many sectors but has three common characteristics: human creativity, symbolic messages, and IP potential (Matulionyte et al., 2017). Mayasari & Chandra (2020) further explain that the industry's outcomes mainly come from IP utilization. This means that IP becomes essential, and it not only protects creative works but also plays an important role in their creation. Every action in this sector comes from the creation and use of IP (Boğa & Topcu, 2020).

Meanwhile, commercializing IP is defined as turning IP assets into a source of revenue (McManus, 2012) to optimize financial returns from investments rooted in innovation (Holgersson & Santen, 2018). The creative industry's growth significantly impacts economic development by generating value from innovative, value-added products and services (Salder, 2021). An important element driving innovation in this sector is the development of IP. Various creative approaches emphasize the value of intangible assets, such as originality and creativity, to create IP assets that foster innovation (Foord, 2009). Therefore, creativity and innovation are two elements that complement each other in the process of IP commercialization in this industry.

Creativity is often recognized as a very complex aspect of human capability, making it difficult to define universally (Tang & Werner, 2017). However, creativity is generally identified as the generation or creation of ideas that are new and practical (Duxbury, 2012). Creativity is realized as a unique or distinctive innovation that comes from individuals who obtain inspiration from everyday life and then convey and interpret this inspiration to the world. In professions related to art, creativity is often perceived as a deeply emotional and personal experience. Designers, for instance, typically find inspiration in their environment, which they then blend with their own emotions. This fusion of external stimuli and personal feelings is expressed through their designs, showcasing a unique interpretation of their experiences and perspectives (Lin et al., 2013).

Creativity is also considered to combine two key elements, originality and effectiveness. On one hand, creativity should lead to unexpected new and original ideas. On the other hand, those ideas have to be useful, valuable, and relevant, especially when in a business context (Deckert, 2017). The characteristic of the current era, which is often referred to as the 'era of creativity,' is a shift in the focus of the economy and society from prioritizing knowledge to prioritizing creativity. This shift marks a change in economic activity, from the production of goods to the generation of ideas (Tang & Werner, 2017).

Creativity in business is a dynamic process that involves two main stages: divergence and convergence. The divergence phase generates many potential solutions, while the convergence phase filters out the less viable ideas. This process usually begins with brainstorming a large number of ideas, which are then narrowed down through careful selection (Ahmed & Sehepherd, 2012).

Innovation and creativity are closely related concepts. Simply put, creativity is the starting point for innovation; a firm first uses creativity and then moves on to innovation. While creativity is often associated with artistic activities, innovation is associated with scientific discoveries or technological advances. However, they are interrelated (Rassanjani et al., 2021). In line with this, Duxbury (2012) argues that creativity is often seen as the first step in the process. To be useful, creative ideas must also be appropriate and have potential value in achieving the desired goals. Creativity, as the generation of practical new ideas, is the first step towards innovation and determines the success of subsequent commercial exploitation. From this perspective, it becomes clearer how a firm can be creative but not yet innovative, illustrating the pre-commercialization phase of any new venture. In other words, first creativity, then innovation. This transition must be conscious, open, and in the right order.

Otherwise, Ahmed & Sehepherd (2012) suggest that the methods of creativity-based innovation are not always sequential. This also tends to be relevant when it refers to the context of the creative industry. Creativity is dynamic due to consumers' constant desire for novelty, resulting in unpredictable market demands. This creates unique innovation challenges for creative businesses (Koch et al., 2023). A strict and orderly set of innovation steps may

be irrelevant to the unpredictable nature of this sector. On the other hand, it can be enhanced by adopting a flexible approach (Ahmed & Sehepherd, 2012).

Numerous academic studies have also presented different frameworks related to creativity-based innovation in the creative industry. Bélanger et al. (2016) suggested that the role of creativity in sustaining continuous innovation involves three phases: pre-production, production, and post-production. The pre-production phase emphasizes resource management and knowledge transfer and involves creating the initial idea. The production phase refers to bringing the idea to life, and the post-production phase takes an open and iterative approach where the idea is refined through iterative design as well as trial and error to ensure the innovation is market-ready.

Furthermore, Granados et al. (2017) proposed that innovation in the creative industry follows a path with three main phases: idea generation, development, and diffusion. In their framework, idea generation and the initial part of development are classified as exploration activities, while the latter part of development and diffusion fall under exploitation or commercialization activities. However, when referring to Bélanger et al.'s (2016) framework, it can be acknowledged that all the phases involving creativity in sustaining continuous innovation are still in the exploration stage and have not yet entered the exploitation or commercialization stage since this phase is when the product is ready to enter the market and has passed the post-production stage. This leads to the idea that the process of creativity lies in the stage of idea generation and the early stage of product development (Figure 4).

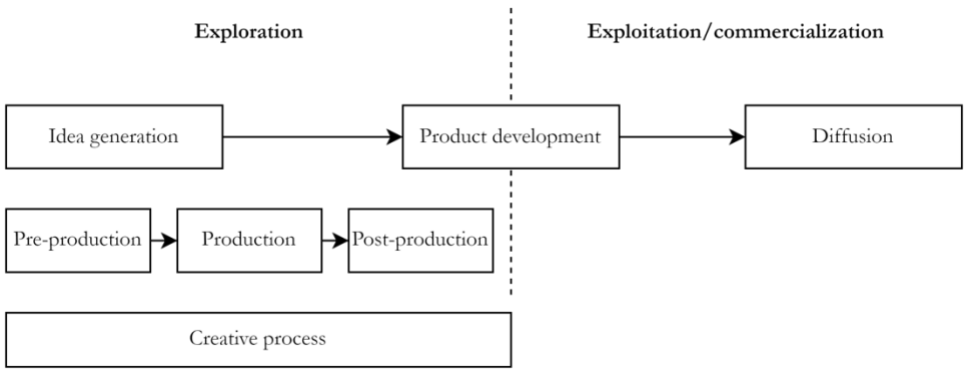

Figure 4: Creative process in innovation

Source: generated by authors based on Bélanger et al. (2016) and Granados et al. (2017)

In the meantime, Efrata et al. (2020) examined the innovation process in new product development in the creative industry through an empirical study. The framework includes the stages of ideation, visualization, and execution. In this instance, the ideation stage includes identifying problems, generating ideas, predicting market trends, and conducting business analysis. This stage is inherently non-linear and flexible, allowing for adaptation based on specific business conditions and market dynamics. It stresses the fluidity of the creative process, where feedback loops and iterations are necessary. Following ideation, the process moves into the visualization phase. In this phase, the focus shifts from conceptualizing ideas to visualizing how they can be transformed into tangible products or services. Finally, the execution stage transforms ideas and visualizations into actual products or services.

In contrast to the stages in the ideation phase, the subsequent phases are referred to as a sequential mechanism (Figure 5). It emphasizes that the innovation process in the creative industry can be realized as a linear or sequential stage. However, at certain phases, it can also be a complex and iterative process involving dynamic interactions between different stages, continuous refinement of ideas, and adaptation to market feedback and evolving conditions. These non-linear characteristics foster greater creativity; however, at the same time, they require careful management to ensure that ideas are not abandoned throughout the process and that the final product retains its commercial viability (Efrata et al., 2020).

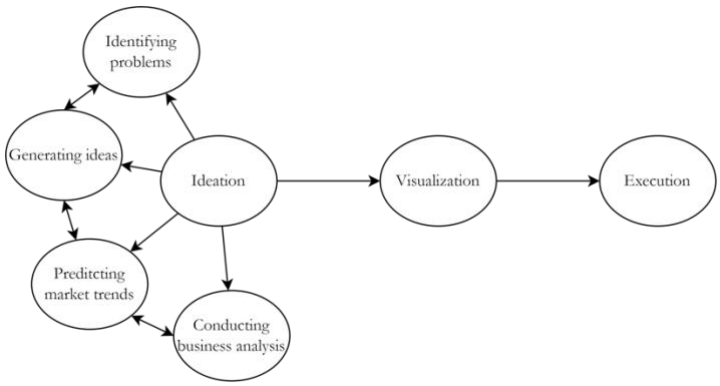

Figure 5: Innovation process in new product development in the creative industry
Source: Efrata et al. (2020)

The discussion on creativity-based innovation yields several key findings: (i) creativity is considered the initial stage of innovation and has a significant role in the pre-commercialization stage (Duxbury, 2012; Rassanjani et al., 2021); (ii) the creative process is widely involved in idea generation and the early stage of product development (Bélanger et al., 2016; Granados et al., 2017), and (iii) creativity-based innovation does not have to be linear (sequential) but can also be adaptive and iterative, especially in the dynamic nature of the creative industry at certain phases (divergent) (Efrata et al., 2020). Accordingly, concepts rooted in creativity-based innovation can be categorized into two dimensions: process-based (refers to the level of flexibility) and creativity-based (refers to the level of creativity).

3.2.1 Integrative Framework of Creativity-Based IP Commercialization

This study employs an integrative literature review method incorporating a systematic review process and blends knowledge from existing literature in the area of IP commercialization, resulting in four phases: ideation, development, creation, and commercialization. These findings were then integrated with the concept of creativity-based innovation within the creative industry.

Creativity-based innovation involves a dynamic and process-oriented approach that combines both divergent and sequential methods to foster innovation. The initial phase of divergence is essentially found in the stage of brainstorming and generating a wide range of ideas (Ahmed & Sehepherd, 2012). This is also exemplified by Efrata et al. (2020), who characterize the ideation stage in the innovation process as representing a non-linear, flexible approach that allows for adaptation to changing market conditions and emphasizes the importance of feedback loops and iterations. Despite the possibility of complex and iterative interactions, linear progression is also shown in extensive whole innovation process (Efrata et al., 2020). This highlights the essential balance between the generation of creative ideas and their practical application, thus ensuring commercial viability amidst the unpredictability of consumer demands (Ahmed & Sehepherd, 2012; Koch et al., 2023).

Moreover, within the dynamic interaction between innovation and creativity, it is crucial to recognize the spectrum of creativity as an integral part of the innovation process. Creativity is considered the initial stage of innovation (Duxbury, 2012; Rassanjani et al., 2021), emphasizing that creativity is crucial in the early stage of innovation. Furthermore, it should be acknowledged that all the phases that involve creativity in promoting continuous innovation are still in the exploration phase of innovation and have not yet reached the exploitation or

commercialization phase. This latter phase occurs when the product is ready to enter the market after completing the post-production phase (Bélanger et al., 2016; Granados et al., 2017). This suggests that the creative process is central to the idea generation stage and the early stages of product development and that the intensity of the creative process may vary across different stages of commercialization.

In light of this discussion, the commercialization process could be mapped within the dimensions of process-based and creativity-based (Figure 6), which is detailed as follows:

(I) **Ideation:** This phase is centered around the initial conceptualization and awareness of IP. This stage is marked by efforts to enhance understanding of IP. This phase sets the foundation for IP development by establishing a strong base of knowledge and creative thinking. As argued by Efrata et al. (2020), this phase requires a high level of creativity and is divergent to filter diverse ideas.

(II) **Development:** In this phase, the focus shifts to improving and refining the IP through structured research and development (R&D). This phase involves the detailed elaboration and improvement of IP concepts initiated in the ideation phase. The development phase is critical for transforming raw ideas into viable IP assets for creation and eventual commercialization; hence, the process is more sequential due to the need for structured progression, legal diligence, and systematic transformation of ideas into viable IP assets. At the same time, high creativity throughout this phase is essential to innovate, adapt, and refine the IP to ensure that it not only meets regulatory and legal standards but also captures the imagination and needs of the market.

(III) **Creation:** The creation phase involves the actual production of the IP. A significant part of this phase is dedicated to testing and validation, ensuring the practical viability and effectiveness of IP assets. It also serves as the bridge between an IP's conceptual development and its introduction to the market. This phase inherently demands a sequential process that is derived from the operational requirements of producing a tangible or finalized IP asset that is ready for market introduction. While creativity is essential to address unforeseen challenges and make minor adjustments, the focus here is on execution, refinement, and ensuring market readiness.

(IV) **Commercialization:** Central to the IP journey, this phase is about bringing the IP to market. This phase encompasses several crucial steps, including market analysis, product launch, scaling up, and establishing a firm's reputation. This phase is characterized by a divergent approach due to the need to explore multiple pathways to market success, adapt strategies based on market feedback, and engage in strategic creativity for marketing and scaling operations. While this phase may not require a high level of creativity in product development, it does require a different form of creativity focused on strategic decision-making, market adaptation, and innovative dissemination and branding strategies to ensure the IP's sustained success in the competitive marketplace.

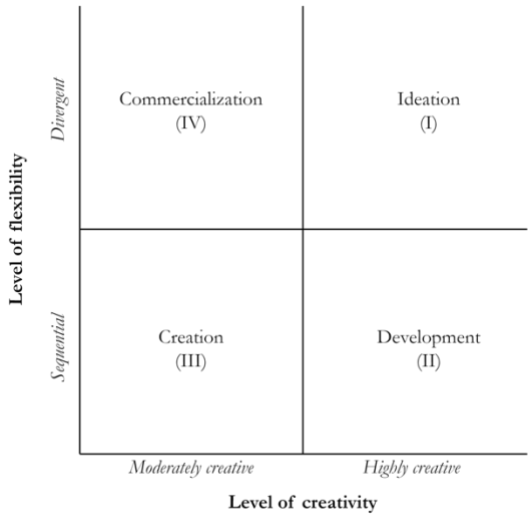

Figure 6: Creativity-based IP commercialization framework

4. Conclusion

The findings differentiate IP commercialization process into four distinct stages: ideation, development, creation, and commercialization, which are further integrated with the concept of creativity-based innovation in the creative industry. It highlights a dynamic and process-oriented approach to innovation that includes both divergent and sequential methods. The ideation phase is characterized by divergent thinking, focusing on brainstorming and generating a wide range of ideas, which is crucial for adapting to changing market conditions and underscores the fundamental role of creativity in innovation. The development phase shifts to a more sequential approach, emphasizing the transformation of ideas into viable IP assets through detailed elaboration and addressing legal aspects while still requiring high levels of creativity for innovation and problem-solving. The creation phase, which focuses on production, testing, and validation, requires a sequential process to ensure operational execution and market readiness, with an emphasis on execution over novel creativity. Finally, the commercialization phase diverges to explore multiple market strategies and paths to success, relying on strategic creativity for market adaptation, dissemination, and branding to ensure the IP's enduring market presence. Taken together, this study highlights the complex interplay between divergent and sequential phases of IP commercialization, each requiring different levels of creativity, thus highlighting the critical balance between the generation of creative ideas and their practical application in navigating the IP journey within the creative industry.

This study contributes to the academic literature by providing an integrative framework to guide further academic inquiry and theoretical development by synthesizing existing knowledge and tailoring it to the creative industry. The proposed framework may guide practitioners, policymakers, and stakeholders in this industry to commercialize the IP assets in the creative industry.

However, this study is not without limitations. In particular, the Scopus database may have excluded some potential studies. Hence, future research may combine sources from various databases besides Scopus to obtain a more holistic knowledge of IP commercialization in the creative industry. This will ensure inclusivity and diversity of the literature analyzed. Additionally, the lack of direct literature on IP commercialization in the creative industry limits the scope of the study. Future research may consider the primary data collection in this area. Empirical studies, such as surveys, in-depth interviews, or case studies, can better understand how IP commercialization is applied in the creative industry. Furthermore, follow-up studies that illustrate the application of this framework in real-world scenarios can provide invaluable insights and further validate the contributions of this research.

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Indonesian Petroleum Industry and Development: A Centennial Survey and Future Prospects

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Abstract
The contribution of oil and gas to development is a classic debate among scholars. Some believe that oil and gas are positively related to development, while others believe the opposite. This study examines the contribution of oil and gas to development in Indonesia. Historical analysis of long-term data series, extracted from statistical documents since the colonial era, shows a positive relationship between oil and development in Indonesia. Although its contribution fluctuates, oil and gas have contributed to growth and welfare. However, the future of Indonesia's oil and gas industry is at stake. Declining reserves and production and shrinking upstream investment due to declining competitiveness amid the green energy transition agenda threaten the sustainability of Indonesia's oil and gas industry in the future.

Keywords: Oil and Gas Development, Ups and Downs, Future Prospects

1. Introduction

The relationship between oil and development has been the subject of classic debate. Some economists believe oil contribute positively to development and prosperity (Ginsburg, 1957; Rostow, 1961; Drake, 1972; Balassa, 1980). Other scholars found oil to be negatively related to development. Producing countries, which depend on oil for their revenue, are less prosperous than non-producing countries. Studies by Nankani (1979), Corden & Neary (1982) and Alan Gelb (1988) show that mineral rents fail to capitalize on long term self-sustaining growth and development. Some of them are even worse off. They are poorer than resource-poor countries and suffer from the so-called resource curse (Auty, 1993; Sach & Warner, 1995, 1999, 2001) or the paradox of plenty (Karl, 1997).

The resource curse thesis explains the entry of the curse through three channels: economic, political and social. From the economic channel, the curse begins to work when policy makers begin to rely on natural resource rents rather than collecting taxes derived from the development of the manufacturing and industrial sectors (Iimi, 2007; Wood & Berge, 1997; Gylfason et al., 1999; Gylfason, 2001). Instead of exercising fiscal discipline, the

availability of 'easy money' makes politicians and bureaucrats wasteful and inefficient. This makes producer countries poorer, regardless of their income levels (Heal, 2006). They spend natural capital faster than they form other capital, hence their savings are limited (Atkinson & Hamilton, 2003; Gylfason & Zoega, 2006; Dietz et al., 2007; Boos & Holm-Müller, 2013). Another factor is price volatility that triggers instability and development failure (Davis & Tilton, 2005; Frankel, 2010; Vander Ploeg & Poelhekke, 2009a, 2009b; 2010).

From the political channel, the curse enters when oil becomes a source of conflict, corruption and rent-seeking and the birth of authoritarianism (Aslaksen, 2010; Dunning, 2008; Haber & Menaldo, 2011; Ross, 2001, 2012; Bannon & Collier, 2003; Ross, 2001). Managed without public accountability, mineral rents become a source of inequality that ignites conflict among stakeholders and fuels horizontal tensions (Sarraf & Jiwanji, 2001; Sala-i Martin & Subramanian, 2012; Davis & Tilton, 2005; Bodea et al., 2016). Oil rents are used to fund political patronage, silence opposition and consolidate autocratic rule (Dunning, 2005; Nting, 2019). Some mineral rents are used to expand the state machine that grows out of the established bureaucracy (Wälde, 1984). From the social channel, the curse sets in when natural resource rents reduce incentives to accumulate human capital due to high levels of non-wage income or natural resource-based wages (Gylfason, 2001; Stijns, 2006; Daniele, 2011; Blanco & Grier, 2012; Shao & Yang, 2014).

However convincing, the curse thesis has provoked sharp criticism. A number of scholars cast doubt on the claimed linear relationship between natural resource wealth and the development curse (Manzano & Rigobon, 2001) and strongly criticized the notion that the curse is an endogenous factor in natural resource wealth (Wright & Czelusta, 2004). James (2015) calls the curse thesis developed by Sach & Warner a statistical mirage because the sampling was done during a period when commodity prices were slumping on the world market. Looking at a longer time interval, the period 1970-2000 was characterized by positive growth in non-extractive sectors such as manufacturing and services. The crux of the problem is not the curse of natural resources, but the speed at which countries diversify into non-resource industries, whether commodity prices rise or fall. The effect of natural resources on development can be positive or negative depending on what countries do with their natural resources (Stijns, 2005). Natural resources can be a blessing or a curse depending on their use and the quality of institutions that determine their utilization in promoting economic growth (Antonakakis et al., 2017). Rather than a curse or a fate, natural resource rents can spur economic development if combined with knowledge accumulation for economic innovation (Lederman & Maloney, 2007).

Reaffirming the stance of classical economists, natural resource wealth is a blessing for development and not a curse. Greater abundance leads to better institutions and more rapid growth (Brunnschweiler & Bulte, 2008). Despite some negative consequences such as widening income inequality, mineral wealth is not a curse and its effects are positive for long-term economic growth (Alexeev & Conrad, 2009). Natural resources increase growth in stable countries, but make volatile countries more unstable which erodes growth prospects (Van der Ploeg & Poelhekke, 2010). Natural resources have a positive effect on growth, but are eroded by volatility. Therefore, the source of the curse is not natural resources and natural resource rents, but the notorious commodity price volatility (Van der Ploeg & Poelhekke, 2009a, 2009b).

What about Indonesia? Although not free from corruption and political patronage, various studies say Indonesia has managed to escape the natural resource curse (Sovacool, 2010). Diversification of the non-hydrocarbon sector ensured growth sustainability when the oil boom era passed and Indonesia avoided Dutch disease (Gelb, 1988). Effective fiscal policy allowed Indonesia to escape the natural resource curse as some of the oil rents were channeled into expanding rural infrastructure and developing a labor-intensive agricultural sector (Auty, 2007). The conservative response of technocrats to the oil boom in the 1970s and a series of deregulation policies pursued in the 1980s allowed Indonesia to escape the Dutch disease (Usui, 1997). Only after Indonesia's revolutionary populist forces were defeated, according to Rosser (2007), capitalist-oriented social groups have pushed Indonesia away from the natural resource curse with open economic policies that opened access to foreign aid, markets, technology and investment. Other scholars mentioned that elements of the Dutch disease were still found in the period 1970-1996, but were successfully eroded after *Reformasi* with three policies, namely fiscal decentralization with 'Revenue Sharing Funds' (*Dana Bagi Hasil*), promotion of the manufacturing sector and improved governance (Taguchi & Khinsamone, 2018).

This paper reinforces the thesis of the positive relationship between petroleum and development. Oil and gas play an important role in Indonesia's development history. Despite the ups and downs of its contribution to development, oil is an important part of Indonesia's post-independence development history. The windfall from rising world oil prices in the first (1973-1975) and second (1980-1981) oil boom was a blessing that made Indonesia more prosperous. A mixture of luck and good management made Indonesia reclaim what Booth (1998) calls 'the history of lost opportunities.' Indonesia carved out a success story of oil-facilitated development, but was able to maintain growth rates when oil prices collapsed and the country developed increasingly outward-looking economic policies (Van Zanden & Marks, 2012: 28).

This paper will analyze the contribution of oil and gas to Indonesia's development over time. The indicators that will be used are economic growth, oil and gas contribution to GDP and social welfare. To explore the prospects of the oil and gas industry in Indonesia, this paper will capture the performance of the oil and gas sector in terms of reserves, production, consumption, exports and imports. Long time series data will provide a full picture of the ups and downs of Indonesia's petroleum industry, its contribution to development and its prospects in the future, including in relation to the energy transition agenda.

2. Method

This study is a qualitative historical analysis of the development of the oil and gas industry in Indonesia based on statistical data extracted from primary sources in the period 1893-2023. These data were obtained from colonial statistical documents published by the Centrale Commissie voor de Statistiek (CCS) (1893-1898), Centraal Bureau voor de Statistiek (CBS) (1899-1923), Centraal Kantoor voor de Statistiek, Departement van Landbouw, Nijverheid and Handel (CKS-DLNH) (1924 s.d. 1933), Centraal Kantoor voor de Statistiek, Department van Economische Zaken (CBS-DEA) (1934-1941), Central Bureau of Statistics, Department of Economic Affairs (CBS-DEA) (1941-1984), *Biro Pusat Statistik* (Central Bureau of Statistics) (1984-1997) and *Badan Pusat Statistik* (BPS Statistics Indonesia) (1998-now). Other sources were extracted from documents of the Ministry of Energy and Mineral Resources (MEMR), BP Migas/SKK Migas, Statistical Review of World Energy and others. These documents are needed to obtain a whole picture, in a long time series, of governance and its impact on the performance of the oil and gas industry and development, especially its ups and downs. Since 1899 until now, Indonesia has experienced five governance regimes, namely concessionary regime (1899-1960), Contract of Work regime (1960-1966), Production Sharing Contract regime (1966-2001), Cooperation Contract regime (2001-2012), and Cooperation Contract regime, with Production Sharing Contract and Gross Split variants since 2017 (2012-2022). The data obtained will be processed and displayed in figures.

3. Result and Discussion

Indonesia's oil and gas industry dates back to the first exploration in 1860 at Mount Ciremai, Cirebon, and commercial production began two decades later. During the period 1890-1900, production came from oil fields in Telaga Said (North Sumatra), Perlak (Aceh) and Sanga-Sanga (East Kalimantan). As drilling activity increased, the colonial government issued the Indische Mijnwet Staatsblad 1899 No. 214. Production continued to increase from thousands of barrels per day to tens of thousands to hundreds of thousands of barrels per day. Production reached its peak during the New Order, averaging 1.3 million barrels per day from 1967-1998 (Figure 1). Indonesia joined OPEC and enjoyed windfall profits from any increase in world oil prices. After the New Order fell, and Law No. 8 of 1971 was overhauled with Oil and Gas Law No. 22 of 2001, Indonesia's oil and gas industry went into decline. This was characterized by declining reserves and production and rising imports due to increased consumption (Figure 2). Since 2004, Indonesia has officially become a net importer of oil and decided to withdraw from OPEC membership in 2008.

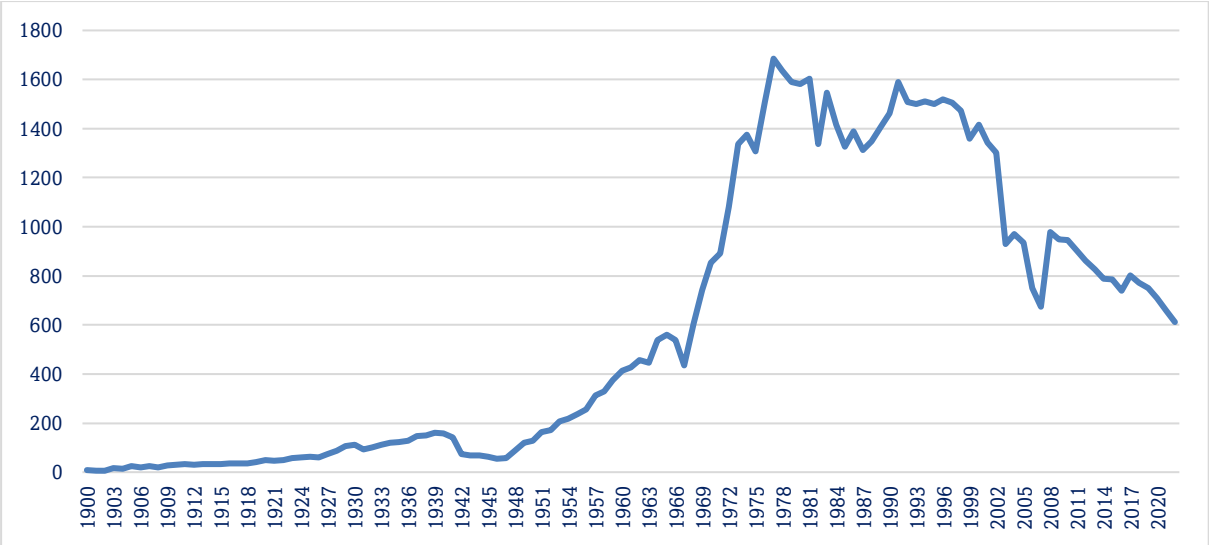

Figure 1: Oil Production, 1900-2022
(Thousand Barrels of Oil per Day)

Source: Statistisch Jaaroverzicht, Indisch Verslag, Statistical Pocketbook of Indonesia, Statistics Indonesia, various years, processed.

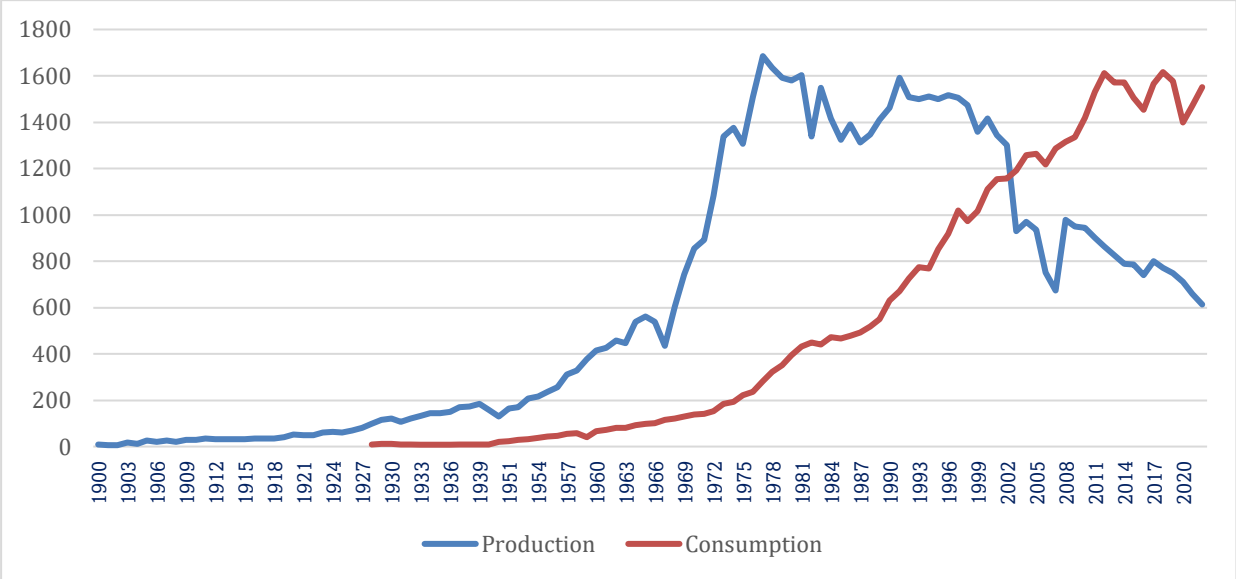

Figure 2: Oil Production vs Consumption
(Thousand Barrels of Oil per Day)

Source: Indisch Verslag, Statistical Pocketbook of Indonesia, Statistics Indonesia, various years, processed.

Natural gas, which began to be produced in 1920, saw production rise from 1975 and continued to increase during the 1980s-1990s. Since 2002, natural gas production has overtaken oil production in oil barrel equivalents. The combined production of oil and gas helped create a surplus of production over consumption. However, for the first time in history, oil and gas production was overtaken by total oil and gas consumption since 2012. Oil and gas production grew by an average of 3 percent annually during 1967-2022, while consumption grew by 6 percent (Figure 3). The double growth of consumption over production changed Indonesia's status as a net importer.

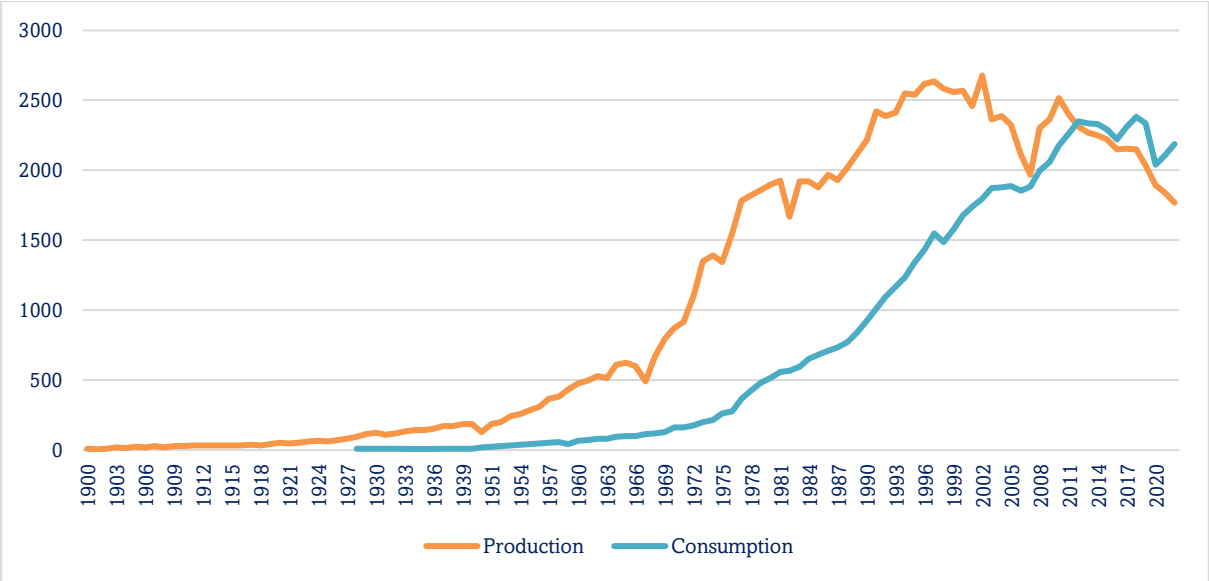

Figure 3: Oil and Gas Production vs Consumption
(Thousand Barrels of Oil Equivalent per Day)
Source: Indisch Verslag, Statistical Pocketbook of Indonesia, Statistics Indonesia, various years, processed.

As with production, oil and gas reserves continue to decline. Oil reserves fell by an average of 3 percent over the period 1980-2001 and 4 percent over the period 2002-2022. In 1980, oil reserves were still 11.6 billion barrels, then fell to 5.1 billion barrels in 2001 and plunged to 2.1 billion barrels in 2022. Gas reserves rose by an average of 2 percent during the 1980-2001 period, but fell by an average of 3 percent during the 2002-2022 period. In 1980, gas reserves reached 28.2 TCF, equivalent to 16.6 billion BOE, rose to 91.8 TCF or 21.4 billion BOE in 2001, then fell to 41.6 TCF or 9.5 billion BOE in 2022 (Figure 4). The oil and gas reserves-to-production (R/P) ratio is fifteen years. This means that, assuming no giant new reserve discoveries, Indonesia will have no more oil and gas reserves to produce in the next one and a half years.

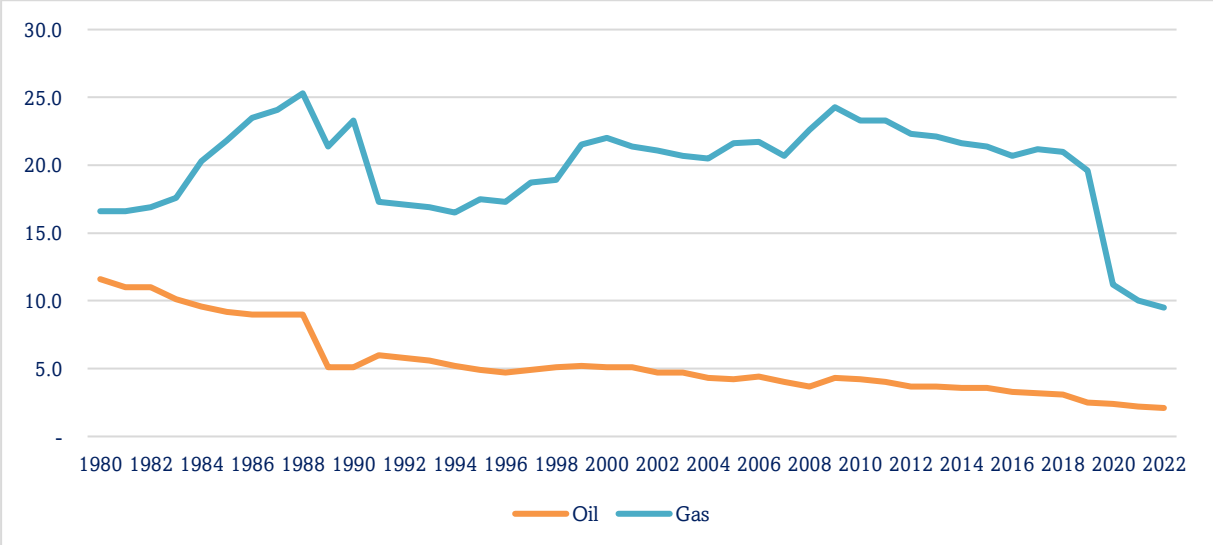

Figure 4: Oil and Gas Reserves
(Billion Barrels of Oil Equivalent)
Source: BP Statistical Review of World Energy

Declining reserves and production have made Indonesia increasingly dependent on imported oil to supply its domestic needs. Oil was once a mainstay export commodity that allowed Indonesia to benefit from any increase in world oil prices. Along with declining production and rising consumption, imports began to overtake exports since 2004. Indonesia drains more foreign exchange for imports than foreign exchange earned from exports.

Starting in 2008, the gap has widened since 2008 until now (Figure 5). The oil and gas trade deficit contributed to the trade balance deficit, which led to the depletion of foreign exchange reserves and the weakening of the rupiah exchange rate (Figure 6).

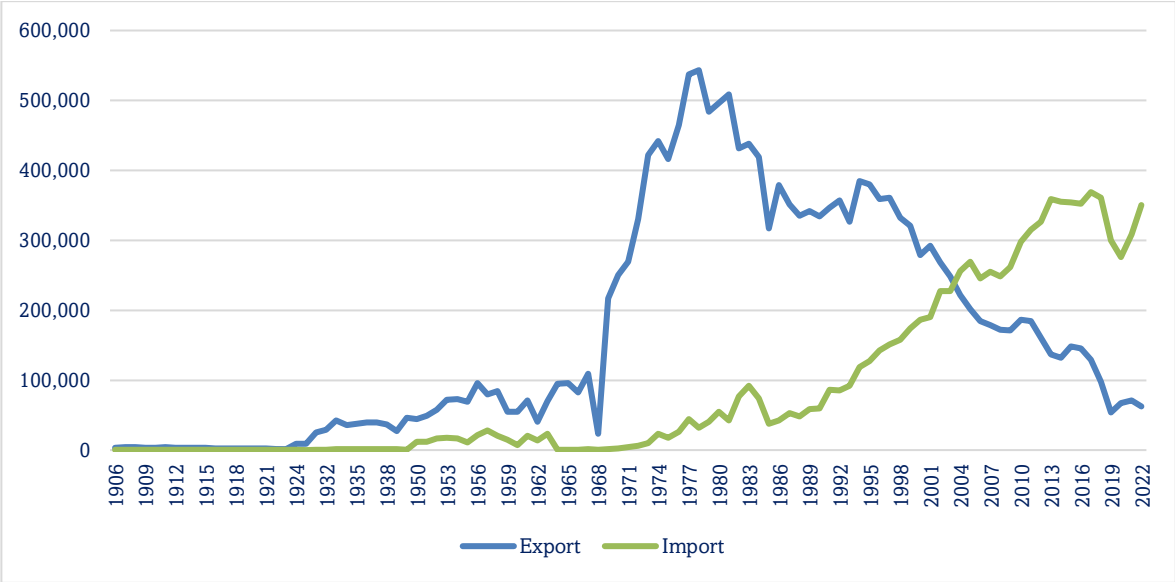

Figure 5: Oil Exports vs Imports
(Thousand Barrels of Oil per Day)

Source: Statistisch Jaaroverzicht voor Nederlandsch-Indië, Meerjarige Overzichten van de In- en Uitvoer van Indonesië, Statistisch Zakboekje voor Nederlandsch-Indië; Statistical Pocketbook of Indonesia, Statistics Indonesia, various years, processed.

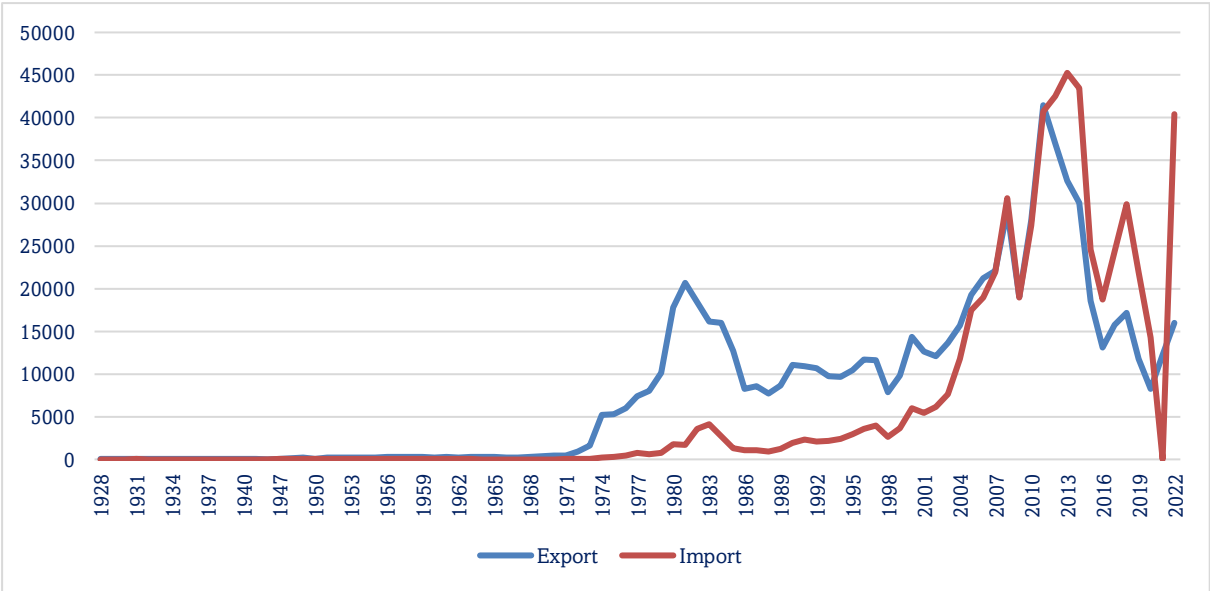

Figure 6: Export vs Import Value of Oil and Gas (Million US$)

Source: Statistisch Jaaroverzicht voor Nederlandsch-Indië, Meerjarige Overzichten van de In- en Uitvoer van Indonesië, Statistisch Zakboekje voor Nederlandsch-Indië; Statistical Pocketbook of Indonesia, Statistics Indonesia, various years, processed.

Starting to fade, oil and gas were once an important component of growth, especially during the New Order. The contribution of oil and gas is shown by the contribution of oil and gas to GDP and the contribution of oil and gas to the state budget. The contribution of oil and gas to GDP during the 1900-1960 period averaged 6.4 percent, then rose to 17.3 percent during the 1960-2001 period, then fell to 4.4 percent during the 2002-2022 period. During the New Order (1967-1998), the contribution of oil and gas to GDP averaged 18 percent (Figure 7).

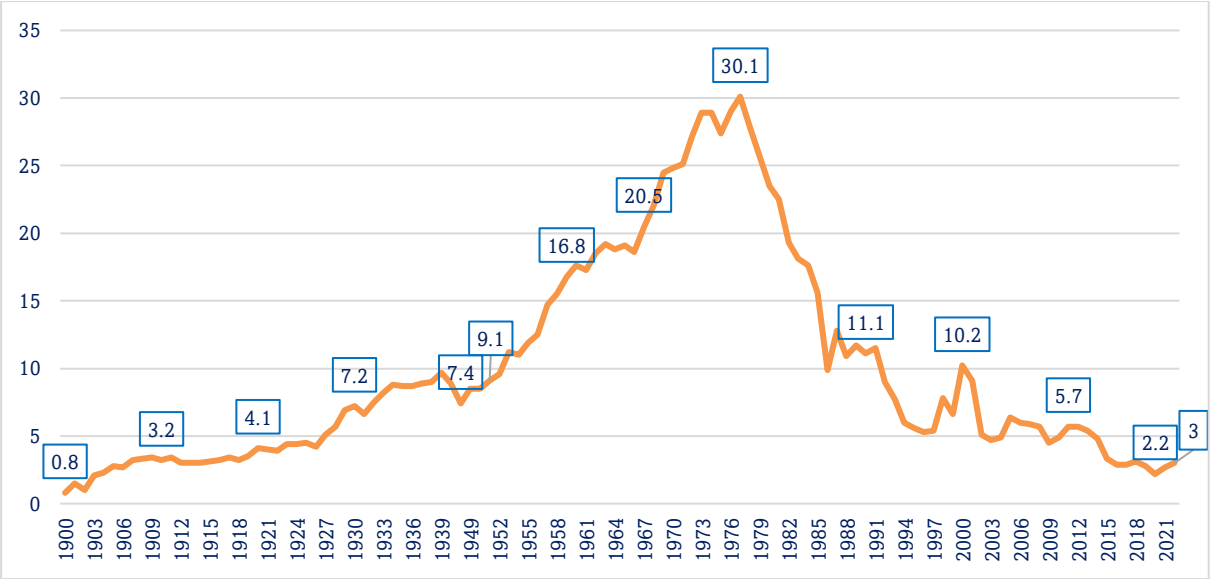

Figure 7: GDP from oil and gas (at current prices) (%)

Source: 1900-1982 data taken from Van der Eng (2010) estimation, 1983-2022 data processed from BPS, Statistics Indonesia, various years.

In terms of revenue, oil and gas accounted for an average of 11.7 percent of government revenue during the 1900-1960 period, with an average amount of IDR 400 million. The ratio rose to 33.5 percent during the 1960-2001 period, with an average amount of IDR 9.8 trillion. During the 2002-2022 period, the ratio dropped to 16.7 percent, but the nominal prorata rose to IDR 173.6 trillion (Figure 8). By 2022, as revenue sources grow and diversify, the ratio of oil and gas revenue to total state revenue will be 8 percent (Figure 9). This shows the transformation of the Indonesian economy, which no longer relies on oil and gas as the prima donna. Oil and gas revenues rose nominally, but fell in percentage terms.

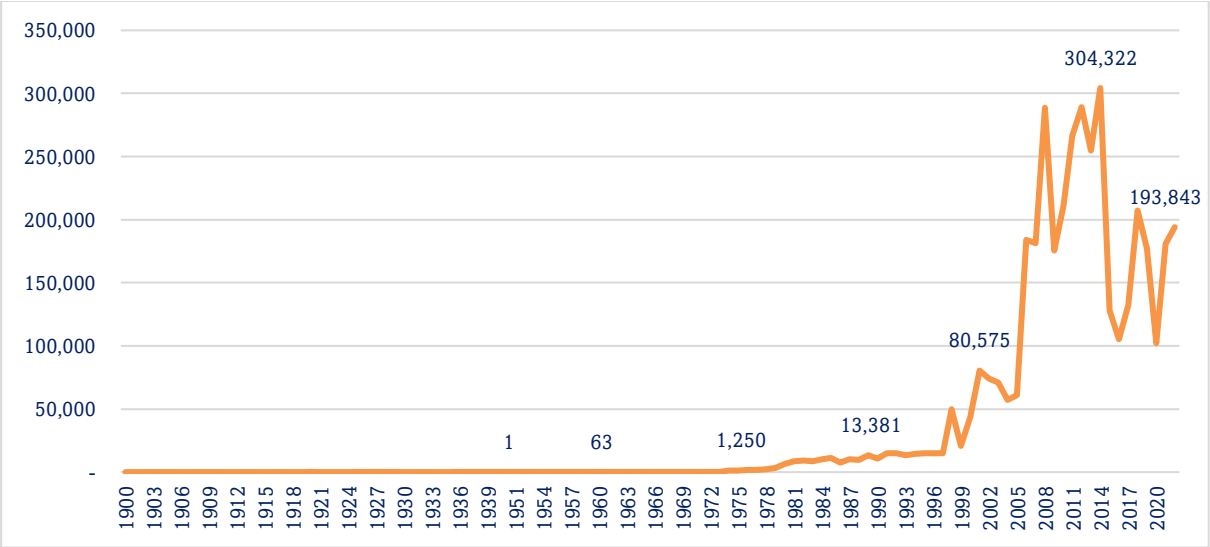

Figure 8: Oil and Gas Revenue, 1900-2022
(Billion IDR)

Source: Indisch Verslag, Statistical Pocketbook of Indonesia, Statistics Indonesia, various years, processed.

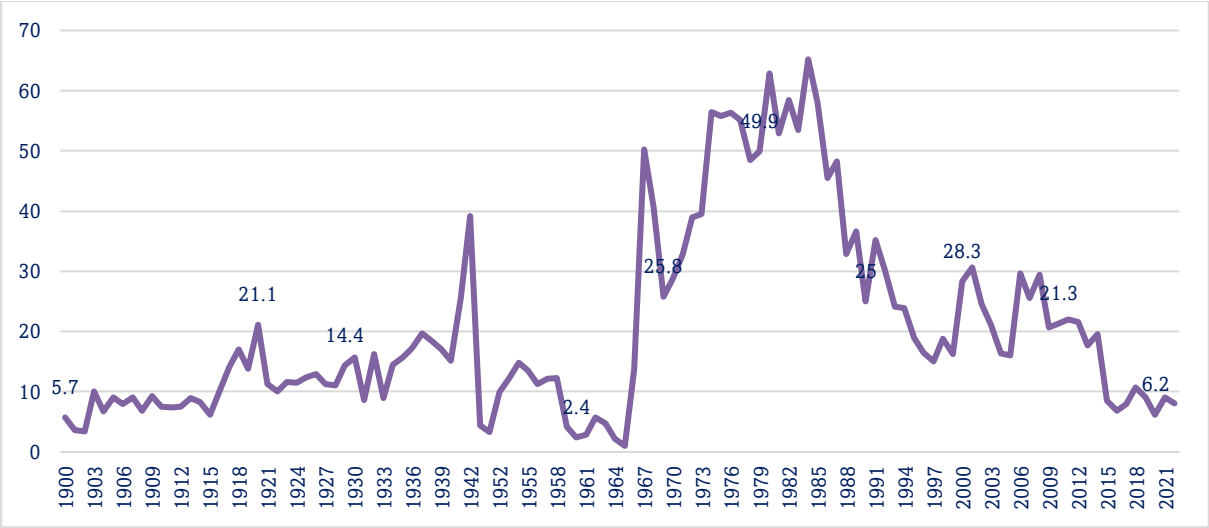

Figure 9: Ratio of Oil and Gas Revenue to State Revenue, 1900-2022 (%)

Source: Indisch Verslag, Statistical Pocketbook of Indonesia, Statistics Indonesia, various years, processed.

The most notable contribution of oil and gas to development occurred during the New Order era. Indeed, some of the oil money was eaten up by Soeharto and his cronies in a corruption octopus that almost bankrupted Pertamina in 1976. However, others were allocated effectively and transformed into thousands of Inpres primary schools (SD Inpres), thousands of health centers (Puskesmas), and improved agricultural infrastructure that led Indonesia to achieve rice self-sufficiency in 1984. In the post-reform era, along with the shrinking share of oil and gas to GDP and state revenue, oil and gas is no longer a social asset to leverage welfare, but an instrument to maintain fiscal balance and macroeconomic stabilizers. Oil money is no longer managed centrally, but shared with the regions following the principle of fiscal decentralization. Unfortunately, oil money was increasingly eroded to pay for subsidies and fuel compensation that were not well targeted. The amount of fuel subsidies and compensation erodes state revenue from the oil and gas sector. In 2020 and 2021, fuel subsidies eroded 91 percent and 75 percent of oil and gas revenues. In 2022, oil and gas revenues were not even enough to support the fuel subsidy and compensation budget, the ratio of which reached 218 percent (Figure 10).

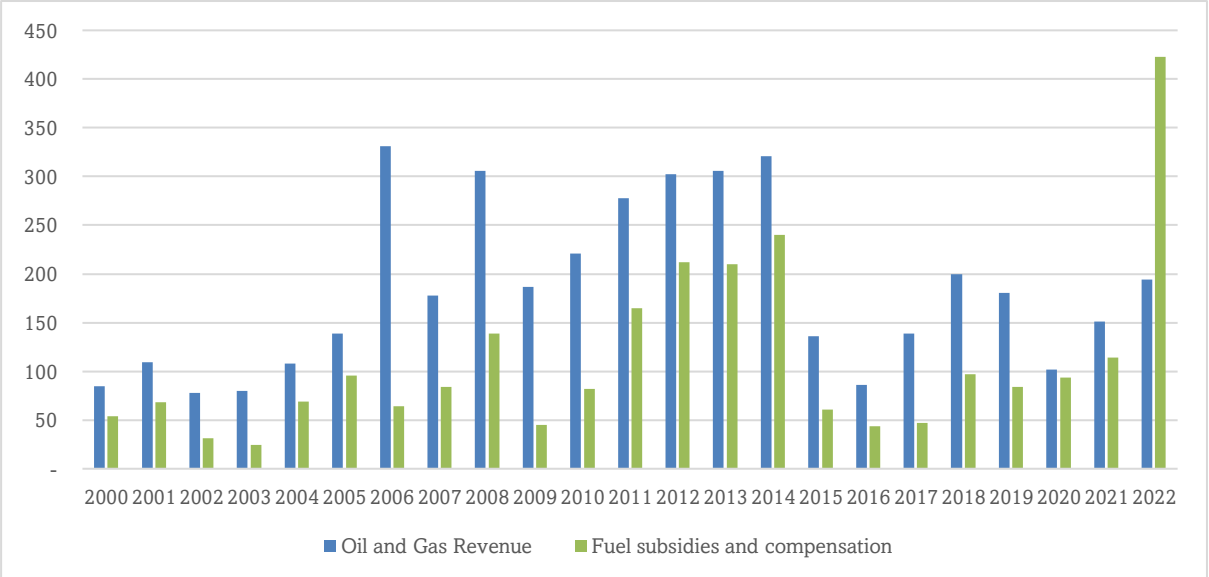

Figure 10: Fuel subsidies and compensation
(IDR Trillion)

Source: LKPP (Central Government Financial Statements), various years, processed

4. Conclusion

Oil and gas had an important contribution to Indonesia's development, especially during the New Order era. Oil money undeniably contributed to alleviating poverty and making Indonesia more prosperous. Unfortunately, oil money is increasingly being eroded to pay for subsidies and fuel compensation that are not well-targeted. This has slowed down the poverty alleviation agenda and widened the gap.

Indonesia's oil and gas industry is in a declining stage. For decades, Indonesia has not discovered giant reserves like the Rokan Block in Riau and the Mahakam Block in East Kalimantan. The oil reserves that are found are small, which are depleted within a few months of production. Exploration found more gas than oil, in the east, offshore and in increasingly deep areas. Fortunately, Indonesia discovered the Cepu Block in 2005, which increased the reserves to production (R/P) ratio.

The decline of Indonesia's oil and gas industry is partly due to technical reasons, but mostly due to non-technical factors. Upstream oil and gas investment has become increasingly complicated, convoluted and bureaucratic, eroding Indonesia's competitiveness in the eyes of investors. In the midst of an energy transition agenda that reduces fossil energy investment, Indonesia could be left behind by investors who choose other countries that promise more ease of doing business. Without an investor-friendly institutional and fiscal design overhaul, Indonesia must not only bury its hopes of boosting oil production to 1 million barrels per day by 2030, but must prepare to see its oil sector collapse even sooner.

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Embracing Circular Economy Principles: How Indonesian MSMEs Food Services Drive Sustainability Through Local Sourcing

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Abstract
This study investigates how Indonesian micro, small, and medium-sized enterprises (MSMEs) food service, specifically two bakeries and restaurants, are embracing circular economy principles to become more sustainable and meet consumer demands. By conducting semi-structured interviews with co-founders and operational managers, it uncovers that sourcing locally is a pivotal strategy for these businesses, driven by the need for supply chain efficiency, environmental and social benefits, and partnerships with local farmers. These practices allow for the provision of local and wholesome menu items, sustainable packaging, and collaborative social responsibility efforts with suppliers. Despite facing challenges like supplier standardization, quality control, and educating employees on waste sorting, the benefits of adopting circular economy practices are clear. Key to success are stakeholder cooperation, effective waste management, and pollution prevention. The findings enrich our understanding of circular economy adoption in the food service sector and offer insights for businesses aiming to boost their sustainability.

Keywords: Circular Economy, Food-Service Sector, Sustainability Practices, Environmental Impact, Indonesian MSMEs

1. Introduction

In the face of escalating global challenges, sustainability has transitioned from a mere buzzword to a crucial battleground where companies vie for future viability. With the global populace on track to reach 9.6 billion by 2050, sparking a projected 70% surge in food demand, the stark reality becomes apparent: one-third of global food production is squandered annually (FAO, 2015). This paradox of plenty underscores the urgent need for systemic change. Emerging from this context, the Circular Economy (CE) framework offers a transformative vision. It proposes a radical departure from the linear "take-make-dispose" model, advocating for a regenerative approach that sees waste and surplus not as inevitable byproducts but as resources for innovation (Sassanelli; et al., 2021).

This model not only aims to mitigate harm but actively enhances societal, environmental, and economic capital, drawing inspiration from concepts like the Ellen MacArthur Foundation's butterfly diagram, the cradle-to-cradle philosophy, and principles of industrial ecology. Simultaneously, the emergence of "concerned consumers" (Kasriel-Alexander, 2015), which signifies a shift in market dynamics. This demographic prioritizes products and businesses that echo their environmental, social, and ethical values, compelling companies to forge deep-rooted connections based on trust and shared sustainability values (Porter & Kramer, 2011).

In the culinary world, skepticism towards the sustainability of large-scale food producers has catalyzed a resurgence in local food initiatives, championed by both grassroots movements and governmental policies. This renaissance in local sourcing is not merely a trend but a movement towards embedding sustainable and healthy production practices within the food industry, challenging dominant players with innovative business models rooted in local traditions and values (Blay-Palmer, 2008; Morgan, 2010; Nestle, 2013). Despite the burgeoning popularity of local food movements, the journey towards truly sustainable food systems is fraught with complexities. In Indonesia, legislative efforts such as the 2012 Food Law and alignment with the Sustainable Development Goals underscore a national commitment to sustainable agriculture and dietary diversity. Yet, achieving these lofty goals necessitates a granular focus on enhancing local supply chains, productivity, and leveraging technology (National Development Planning Agency (Bappenas), 2020; World Food Programme, 2021).

Bandung and Yogyakarta, two prominent cities in Indonesia, hold significant potential in their traditional culinary industries, primarily driven by the abundant use of local ingredients. These cities are renowned for their rich and diverse culinary heritage, which attracts both local and international tourists. The utilization of local materials not only supports regional farmers and producers but also helps preserve the authenticity and cultural heritage of Indonesian cuisine (Hajarrahmah & Melani, 2017). However, both cities face notable challenges in waste management. The landfills in these two regions are facing operational challenges. The Piyungan landfill in Yogyakarta is nearing its capacity limit, leading the local government to restrict the amount of waste sent there. Meanwhile, in Bandung, the Sarimukti landfill suffered a fire incident, rendering it non-functional. This juxtaposition of thriving culinary sectors with waste management issues underscores the importance of conducting research in Bandung and Yogyakarta. Investigating sustainable practices in the culinary industry and exploring innovative waste management solutions are imperative for these cities. Such research could lead to more sustainable culinary practices that benefit the environment while supporting local economies and communities. This synergy in the triple bottom line concept under sustainable business makes Bandung and Yogyakarta ideal locations for research focusing on sustainable development in the food sector.

This research introduces a new approach by examining how Bandung and Yogyakarta's use of local ingredients impacts sustainability in their food industries. Focusing on these Indonesian cities brings a fresh outlook on combining local food practices with sustainability, cultural preservation, and waste management. Thus, the research focuses on exploring the ways in which bakeries and restaurants in Bandung and Yogyakarta adopt sustainable business practices by utilizing local ingredients. It seeks to uncover the driving forces behind such choices, pinpoint the challenges and advantages involved, and determine the contributing to their success.

2. Literature Review

2.1 Circular Economy in the Food Service Sector

The concept of the Circular Economy (CE) has evolved significantly since it was first introduced by Pearce and Turner in 1989, tracing its conceptual origins back to the 1960s and undergoing substantial development thanks to contributions from various researchers and theorists (Zink & Geyer, 2017). Despite the consolidation of 114 definitions by Kirchherr et al., (2017), a universally recognized definition of CE remains elusive, with many interpretations stressing the maxim that "there's no such thing as waste." The principles of CE advocate for resource renewability, reusability, and harmlessness, pushing for the extension of resource lifespans through maintenance,

repair, upgrades, and the recapture of waste for reutilization, embodying an ideological shift towards minimizing waste and maximizing resource efficiency (Arruda et al., 2021).

This evolution from the early adoption of the 3R principles (reduce, reuse, recycle) to the expansive 10R framework illustrates the industry's incremental steps towards a deeper commitment to sustainability, highlighting a growing understanding of resource optimization and waste reduction across different stages, from refusing resource usage to re-mining valuable elements from waste (Kristoffersen et al., 2021). However, transitioning to a CE model presents significant challenges, particularly in sectors like food service, where the principles of CE offer profound implications for enhancing product and service value retention through innovative waste utilization and sustainable practices (Patwa et al., 2021). Despite the potential for CE to bridge sustainability objectives with business practices, the food service industry faces hurdles such as limited consumer awareness, economic constraints, and the complexity of establishing closed-loop systems within fragmented supply chains (Sahu et al., 2022). These barriers underscore a critical research gap: the need for strategies that effectively overcome these obstacles to implement CE principles in the food service sector (Wynn & Jones, 2022). Investigating solutions for aligning multiple supply chain stakeholders towards common sustainability goals, amidst varying levels of commitment and understanding, could provide actionable insights for advancing CE practices in this unique industry context, driving forward the sustainable transformation of food service practices (Camacho-Otero et al., 2018).

2.2 Resource Based View Theory

The Resource-Based View (RBV) provides a robust framework for understanding how firms can strategically utilize their internal resources, both tangible and intangible, to carve out a sustainable competitive edge (Madhani, 2010). This approach is particularly relevant for Small and Medium-sized Enterprises (SMEs) aiming for international expansion, underscoring the critical role of a firm’s unique resources and capabilities in securing a niche in the global market (Khan et al., 2023). Literature extensively supports the RBV, highlighting the necessity for SMEs to effectively leverage their existing assets to navigate the challenges and opportunities presented by international markets (Pankaj M Madhani, 2014). In the food industry, especially among restaurants and bakeries, the RBV underscores the importance of local sourcing practices as a strategic management tool (Williamson et al., 2012). By leveraging distinct resources and capabilities to source ingredients locally, food SMEs enhance the quality and sustainability of their products, thereby creating competitive advantages, fostering community relationships, and promoting environmental sustainability (G. Gupta et al., 2018).

Building on the foundation laid by the RBV, the Natural Resource-Based View (NRBV) introduces a nuanced perspective by incorporating ecological and societal concerns into the strategic equation, emphasizing the importance of sustainability in achieving competitive advantage (Hart & Dowell, 2011a). Developed by (Hart & Dowell, 2011b), the NRBV extends the RBV by arguing that resources derived from environmental and social issues can be crucial for firm success, especially in today's eco-conscious market. It identifies four key areas—pollution prevention, product stewardship, clean technologies, and the base of the pyramid (BoP) strategies—as core resources that firms can leverage for sustainable gain (Münch et al., 2022). This integration of the RBV and NRBV frameworks illuminates a path for Indonesian food SMEs and similar entities globally, illustrating how local sourcing can be a strategic endeavor that not only responds to consumer demands for sustainability but also capitalizes on the unique resources and capabilities highlighted by the NRBV (McDougall et al., 2019). By bridging the RBV's focus on leveraging internal resources for competitive advantage with the NRBV's emphasis on sustainability and societal well-being, businesses are better equipped to navigate the complexities of the modern market, ensuring resilience and long-term success through sustainable practices (Gabler et al., 2023).

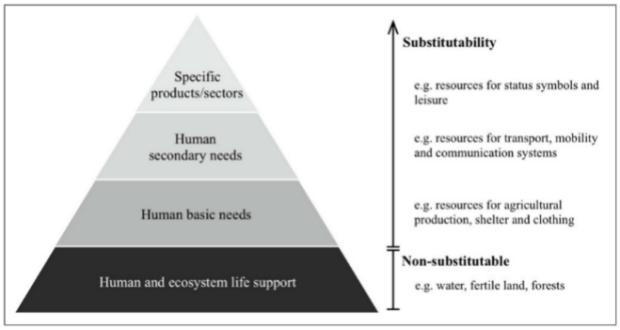

Figure 1: Prioritization of natural resource needs adapted from (Mancini et al. 2016)

3. METHODS

3.1 Participants

In this research the author employed a strategic case selection process driven by the research focus on local sourcing as sustainable strategic in the business. The decision to use non-probability sampling, specifically purposive sampling, was deliberate and crucial for the study. Purposive or judgmental sampling allows for the exercise of your discernment in choosing cases that are most suitable for addressing your research inquiries and fulfilling your research objectives. This sampling approach is commonly employed when dealing with limited samples, as seen in case study research, and when the aim is to select cases that offer a high degree of informativeness (Saunders et al., 2019). To guarantee the accuracy of the sample and obtain extensive information, the participants consisted of four operation managers from each bakery and restaurant as follows:

Table 1: The list of Interview Participants and Description of Business Cases

Case Firms	Employees (person)	Core Business	Place	Interview (duration)
A (start circular)	0-15	Bakery	Bandung	Co-founder (64 minutes)
B (growing circular)	0-15	Bakery	Yogyakarta	Operational Manager (60 minutes)
C (growing circular)	0-30	Restaurant	Yogyakarta	Operational Manager (60 minutes)
D (growing circular)	0-10	Restaurant	Yogyakarta	Founder (45 minutes)

Participants were encouraged to focus on the driving forces behind the management choices to use local raw materials in their operations, What are the challenges and advantages faced, and determine the critical factors contributing to their success. This offers a holistic understanding through the varied narratives and perspectives of the participants involved in the multiple case studies.

In the delineation of businesses based on their circular economy practices, "A (start circular)" signifies a firm at the nascent stage of integrating circular principles, indicating A's recent endeavors to embed sustainability into its operations through initial steps like local sourcing and waste reduction. Conversely, entities labeled as "B (growing circular)," "C (growing circular)," and "D (growing circular)" represent establishments that have advanced beyond the foundational phase of circular economy implementation, highlighting an evolutionary journey towards deepening their circular economy commitments. The term "growing circular" underscores a progression from mere initiation to a phase where circular practices are not just adopted but are being expanded, refined, and increasingly woven into the fabric of business operations. This classification reflects the businesses' maturity spectrum in adopting circular economy models, from early-stage incorporation with "start circular" to more developed, expanding practices under "growing circular," showcasing a dynamic range of engagement with sustainability and resource efficiency within their respective sectors. Participants were encouraged to focus on the driving forces

behind the management choices to use local raw materials in their operations, What are the challenges and advantages faced, and determine the critical factors contributing to their success. This offers a holistic understanding through the varied narratives and perspectives of the participants involved in the multiple case studies.

3.2 Coding Procedures and Data Analysis

In this research, a qualitative methodology has been adopted, employing a multi-case study approach to gain in-depth insights into the several food service sectors. The study encompasses multiple cases, allowing for a comprehensive exploration of diverse perspectives within the chosen context. The primary method of data collection involves semi-structured interviews with the co-founders or operational managers from four different restaurants and bakeries, providing a flexible and open-ended answer for participants to share their experiences, opinions, and insights.

In this research, the author uses the thematic analysis method for identifying, analyzing, and interpreting patterns of meaning (themes) within the qualitative data. This approach discourages predetermined coding frameworks, favoring a method that constructs a social reality reflective of existing theories while contributing new insights (Clarke & Braun, 2017). It minimally organizes and describes the data set in rich detail and often interprets various aspects of the research topic. A case study employing Thematic Analysis involves a deep dive into the case context, where data collected through interviews and observations is systematically coded into themes that represent the nuances of the case. This method allows authors to surface underlying meanings, offering insights into the complexities of the case study subject.

4. Results and Discussions

The analysis presented in this section provides a comprehensive examination of the thematic elements identified through the coding process. This exploration aims to uncover the primary drivers, advantages, challenges, and stakeholder cooperation efforts within the food service industry's adoption of circular economy practices in Indonesia. The detailed insights gathered from interviews with various food service establishments highlight the intricate dynamics and practical implications of integrating sustainable practices into daily operations.

The following table outlines the key themes and sub-themes derived from the interviews, accompanied by representative quotations that illustrate the industry's commitment to sustainability, the benefits realized from such practices, and the challenges faced in this transition. This thematic analysis serves as a foundation for understanding the broader impact of circular economy principles on the food service sector, offering valuable perspectives for both practitioners and researchers interested in sustainable development.

Table 2: Thematic Analysis Result from the Interview Process

Theme	Sub-theme	Quotation
Drivers	Adoption of Locally Sourced Ingredients	"The analysis indicates that a key driver for the food service industry, especially within micro, small, and medium-sized enterprises (MSMEs), is the adoption of locally sourced ingredients within their operations."
	Efficiency of Supply Chain with Local Ingredients	"It emphasizes the importance of understanding how local ingredients enhance the efficiency of the supply chain for the business, streamlining the delivery process for quicker turnaround."
	Environmental and Social Impact	"Their dedication to minimizing environmental impact and fostering sustainable practices."
	Direct Sourcing from Local Farmers	"By opting for fresh produce directly from local farmers and distributors daily, these businesses aim to provide meals crafted from the freshest inputs available."

Theme	Sub-theme	Quotation
Advantages	Local and Wholesome Menu Offerings	"The food service industry demonstrates strengths across all elements of the Natural Resource-Based View framework... through a steadfast commitment to offering menus that incorporate local and wholesome ingredients."
	Sustainable Packaging and Practices	"The sector adopts eco-friendly practices, such as utilizing sustainable packaging solutions and reducing the reliance on single-use straws, provided only upon customer request."
	Supplier Collaboration and Social Responsibility	"These businesses prioritize collaboration, conducting preliminary audits with suppliers and fostering strong relationships for better oversight."
Challenges	Supplier Standardization and Quality Control	"Despite establishing strong cooperation and meticulous monitoring with suppliers, challenges persist, particularly with small-scale suppliers like farmers and intermediaries who lack standardized practices."
	Employee Education on Waste Sorting	"There is an ongoing struggle to educate employees on effective waste sorting, which is essential for efficient waste management."
Stakeholder Cooperation	Supplier Performance Assessments	"In their collaboration with stakeholders, businesses within the food service industry make routine visits to their suppliers' locations, typically on a quarterly or annual basis, to assess the supplier's condition."
Waste Management Practices	Kitchen Waste Utilization	"The food service industry adopts measures to minimize kitchen waste, repurposing usable food scraps into new dishes, such as transforming egg whites into pavlova and using vegetable offcuts for broth."
	Eco-friendly Ingredient Choices	"For waste management, these businesses engage vendors to handle various waste types, including plastics, glass bottles, and paper, and distribute kitchen scraps to employees who raise chickens, ducks, or fish, ensuring comprehensive waste utilization."
Pollution Prevention (Consolidated)	Environmentally Friendly Packaging Adoption	"Most bakeries and restaurants have been using environmentally friendly packaging because of their concern for non-biodegradable waste."
	Comprehensive Waste Management Strategies	"For waste management, these businesses engage vendors to handle various waste types, ensuring comprehensive waste utilization and minimizing environmental impact."

4.1 Drivers

Subsequently, the food service industry's pivot towards circular economy principles is motivated by pivotal elements such as volatile raw material supplies impacting operational expenses, increasing consumer advocacy for sustainability, the direct influence of sourcing and waste disposal methods on scope 3 emissions, and rigorous compliance with environmental regulations. This shift involves transitioning towards sustainable sourcing and production practices, which entail collaborating with suppliers for environmental impact evaluations, embracing renewable energy sources, and optimizing water and energy use. Moreover, evolving towards eco-friendly packaging solutions incorporating biodegradable and recycled materials alongside minimalistic design strategies and cultivating an ecosystem of partners underscores the criticality of stakeholder collaboration in fostering a circular economy ethos. This comprehensive strategy not only meets environmental and compliance demands but also steers the food service sector towards resilience and economic viability, stressing the significance of embedding circular economy principles to forge a sustainable, efficient ecosystem benefiting society and the environment at large.

Lastly, the analysis accentuates a significant catalyst driving the food service industry, especially among micro, small, and medium-sized enterprises (MSMEs), towards integrating locally sourced ingredients into their operational model. This strategy transcends the mere establishment of an efficient and expedient supply chain to reflect a profound dedication to sustainability and environmental guardianship. Supported by Scoppola's 2022

findings, the dependency on local farmers has emerged as a stabilizing force for the food system during periods of adversity, such as the global pandemic, which drastically disrupted conventional food distribution avenues. Moreover, these enterprises are resolute in diminishing their environmental footprint and championing practices that extend beyond profitability to encompass social and ecological benefits. Committing to fresh, additive-free natural ingredients enables restaurants and bakeries to offer more wholesome food selections. By sourcing directly from local producers, these businesses not only assure ingredient freshness but also considerably reduce the carbon emissions linked with distant transport.

This deliberate choice underpins the creation of business models that are environmentally friendly, inclusive, and financially feasible, leveraging the base of the pyramid principle. Thus, the utilization of local resources serves dual purposes: curtailing operational costs and fortifying the local agricultural community, thereby manifesting a mutually beneficial scenario for businesses and the wider community.

4.2 Advantages

The circular economy's role in the food service industry underscores significant strides towards sustainability and resilience. Interviews with entities like Case A and B Bakery reveal a keen focus on leveraging circular principles to not only enhance GDP and employment but also to drive a sustainable business ethos. Inspired by national reports on the circular economy's potential in Indonesia, these businesses have adopted sustainable practices such as waste utilization and local sourcing, pointing to a larger trend of integrating circular economy principles for economic and environmental benefit. Local sourcing stands out as a pivotal strategy, promoting independence through the use of local ingredients, which aligns with consumer trends, supports local economies, and reduces supply chain carbon footprints. Additionally, product innovation, demonstrated through developments like gluten-free flour bases, exemplifies how circular practices catalyze business innovation and respond to the growing demand for sustainable food options.

Collaboration with suppliers forms the bedrock of executing circular economy advantages, where strategic partnerships underscore sustainability's role in enhancing supply chain resilience. Engagements, such as with local mocaf (modified cassava flour) suppliers and free-range egg suppliers, highlight how mutual sustainability commitments can solidify business relationships and ensure a consistent supply of sustainable raw materials. However, these endeavors come with their own set of challenges, including balancing supply with demand, addressing the intricacies of local sourcing, and maintaining operational sustainability. Altogether, the adoption of circular economy principles by the food service industry not only mitigates environmental impacts but also establishes a competitive advantage in an increasingly eco-conscious market. This dual focus on sustainability and innovation through local sourcing, collaboration, and product development showcases the circular economy's transformative potential in fostering economic growth, environmental stewardship, and social well-being.

4.3 Challenges

Integrating circular economy principles into the food service industry offers numerous environmental and operational benefits but comes with its share of obstacles. The foremost challenge lies in securing a reliable supply of high-quality, locally sourced ingredients. Establishments such as Case A Bakery and Case C Restaurant, despite their commitment to embodying circular economy concepts like sustainable sourcing and waste reduction, frequently grapple with the difficulties of maintaining a balanced supply-demand equation. This is particularly acute with small-scale local suppliers, who may lack the capability to meet demands or uphold quality standards consistently. Moreover, the imperative for innovation compounds these challenges as businesses endeavor to develop new offerings that adhere to circular economy principles without sacrificing product quality or customer satisfaction.

In addition to supply chain issues, fostering effective collaborations with suppliers represents a significant hurdle, necessitating extensive effort and open communication to cultivate trust and mutual understanding, particularly in the pursuit of more sustainable practices. This is vividly illustrated in Case A's engagement with mocaf suppliers, underscoring the need for ongoing dialogue to ensure a steady and sustainable ingredient supply. The transition

towards sustainable packaging options and the efficient management of waste further add to the logistical and financial demands faced by businesses. Coupled with the challenges in product stewardship, such as the variance in sales affecting demand forecasting accuracy and the limitations in local sourcing impacting menu development, these issues highlight the complexities of fully integrating circular economy practices. Additionally, the task of promoting pollution prevention and sustaining business viability, particularly without formalized agreements to ensure supplier accountability, emphasizes the intricate nature of adopting circular economy models in the food service sector, underscoring the necessity for strategic planning, strong partnerships, and constant innovation to navigate these challenges successfully.

4.4 Stakeholder Cooperation

In the realm of the food service industry's transition towards circular economy practices, stakeholder cooperation emerges as a critical factor in navigating the complexities of sustainable operations. Initiatives such as those undertaken by Case A Bakery and Case C Restaurant illustrate a strategic alignment with the principles of circular economy aimed at minimizing waste and maximizing resource efficiency. These efforts are underpinned by a commitment to using locally sourced ingredients, not merely as a means to ensure the freshness and quality of the food offered but also as a strategy to bolster local economies and reduce the environmental impact associated with transportation and conventional agricultural practices.

In their collaboration with stakeholders, businesses within the food service industry make routine visits to their suppliers' locations, typically on a quarterly or annual basis, to assess the supplier's condition. Moreover, this partnership includes performance assessments, though these are typically reserved for instances of negative occurrences. The collaboration between these entities and their suppliers exemplifies a symbiotic relationship that extends beyond traditional business transactions. For example, Case A Bakery's partnership with Bandung Mocaf for the supply of mocaf flour is a testament to the bakery's dedication to innovation in product development, while also adhering to circular principles. Such collaborations are instrumental in addressing the dual challenges of maintaining a reliable supply chain and adhering to sustainable practices. This is particularly crucial in a landscape where small-scale suppliers may struggle with the capacity to meet fluctuating demand or maintain consistent quality standards.

Furthermore, these collaborative efforts are not limited to the immediate supply chain but also encompass a broader stakeholder engagement strategy. This includes fostering community ties, sharing knowledge and practices within the industry, and engaging customers in the sustainability journey. For instance, initiatives to educate consumers on the importance of sustainable consumption practices, coupled with efforts to introduce eco-friendly packaging options like paper craft and cassava bags, demonstrate a holistic approach to stakeholder cooperation. Looking ahead, these businesses aspire to establish a platform that would serve as a collective forum for peers and partners in the industry, facilitating the exchange of knowledge and best practices.

However, the journey towards full integration of circular economy practices is fraught with challenges. From the nuances of managing supply and demand to the imperative of ensuring product quality and innovation, businesses find themselves at the nexus of operational efficiency and sustainability. The path forward requires ongoing dialogue, support, and mutual understanding among all stakeholders involved. By forging strong relationships with suppliers, investing in community engagement, and continuously innovating to meet the demands of a circular economy, businesses like Case A Bakery and Case C Restaurant pave the way for a more sustainable future. Their experiences highlight the importance of stakeholder cooperation in overcoming the hurdles of circular economy implementation, underscoring the potential for collective action to drive meaningful change in the food service industry and beyond.

4.5 Waste Management Practices

In the pursuit of sustainability, the food service industry is increasingly adopting circular economy practices, focusing on reducing waste and maximizing resource utilization. The food service industry not only prioritizes local products but also places a high importance on environmental sustainability, adopting effective waste

management practices. Key strategies include sourcing locally to minimize waste and carbon emissions, innovating with sustainable product development such as using alternative flours, and collaborating with suppliers to encourage sustainable agricultural practices. They implement various measures to minimize kitchen waste, repurposing usable food scraps into new dishes; for example, transforming egg whites into pavlova in one case, creating *crouton* from leftover sourdough and utilizing vegetable offcuts for broth in another. Furthermore, they opt for eco-friendly ingredients, such as replacing palm oil with coconut oil, to prevent agricultural land degradation.

These efforts are complemented by the adoption of sustainable packaging solutions, such as biodegradable materials, and effective waste management through composting and recycling initiatives. For waste management, these businesses engage vendors to handle various waste types, including plastics, glass bottles, and paper. Uniquely, kitchen scraps are distributed to employees who raise chickens, ducks, or fish, ensuring comprehensive waste utilization. Additionally, community engagement and consumer education play crucial roles in promoting sustainability within the industry, emphasizing the importance of reducing food waste and supporting local economies.

However, implementing these practices presents challenges, particularly in maintaining a consistent supply of quality ingredients from small-scale suppliers and managing the supply-demand balance. Continuous innovation and adaptation are necessary to overcome these hurdles, requiring businesses to explore new product developments and sustainable ingredient alternatives actively. Moreover, overcoming logistical and financial challenges related to sustainable packaging and waste management requires strategic planning and investment. Despite these challenges, the food service industry's commitment to circular economy principles signifies a crucial step towards environmental sustainability, showcasing a model of operation that prioritizes ecological responsibility, social impact, and economic viability.

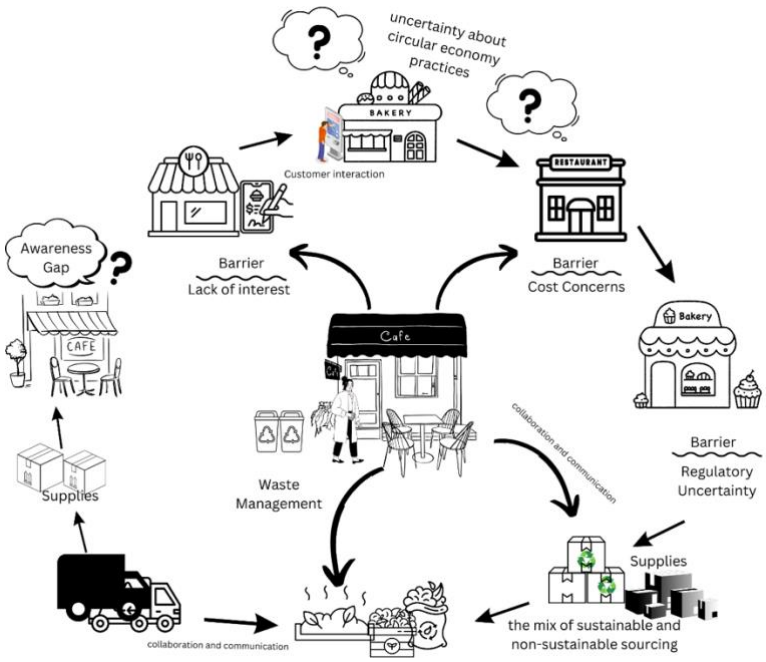

Figure 2: Food Services Circular Economy Practices (source: author)

Figure 2 shows the intricacies of integrating circular economy practices within the food service industry, depicting a café as the nexus of an intricate web of stakeholder interactions that include suppliers, customers, and regulatory bodies (Sumter et al., 2021). It emphasizes the barriers such as an awareness gap, where a lack of understanding about sustainable practices prevails; customer uncertainty, signaling a need for education; cost concerns, that deter the adoption of eco-friendly measures; and regulatory uncertainty, which complicates compliance (Grafström & Aasma, 2021). Central to this ecosystem is the challenge of waste management within the café, underscoring a critical aspect of circular economy efforts. Additionally, the image highlights the tension between utilizing

sustainable and conventional sources, suggesting that while progress is being made, a concerted effort in education, innovation, and strategic partnerships is required to navigate these challenges successfully, reflecting the principles of the Natural Resource-Based View (NRBV) framework which suggests that competitive advantage can be gained through sustainability-focused business practices (Rousseau, 2017).

On the social front, these entrepreneurs invest in educating their staff on waste processing techniques through targeted training sessions, aligning with the pollution prevention strategy of NRBV. Effective waste management is crucial for reducing the environmental impact of business operations, and employee training plays a vital role in ensuring that waste is properly sorted, handled, and disposed of (Lozano, 2015). They also conduct studies to optimize food portions served to customers, aiming to reduce food waste. Food waste is a significant contributor to greenhouse gas emissions and resource depletion, making portion control a valuable strategy for minimizing waste and promoting sustainability (Papargyropoulou et al., 2019).

Customer education is another focus for food service businesses in their pursuit of sustainability, with practices like refraining from providing straws or cutlery unless necessary further underscoring their commitment to environmental stewardship. By educating customers and encouraging them to adopt more sustainable habits, these businesses can foster a culture of environmental responsibility and reduce their overall ecological footprint. These initiatives resonate with the concept of social sustainability, which emphasizes the importance of engaging with stakeholders and promoting responsible consumption patterns (Hutchins & Sutherland, 2008).

After consolidating the results based on the four strategies of the Natural Resource-Based View (NRBV) – pollution prevention, product stewardship, clean technology, and base of the pyramid – the businesses further categorized them into five dynamic capabilities, as illustrated in Figure 1. Regarding pollution prevention, there is an ongoing struggle to educate employees on effective waste sorting, which is essential for efficient waste management. This highlights the importance of continuous training and awareness programs to ensure effective implementation of pollution prevention strategies (Lozano, 2015).

Product stewardship within the industry is driven by a growing awareness of the environmental impact of food production and consumption. Advantages of this approach include reduced environmental footprints through sustainable sourcing and waste minimization, enhancing brand reputation and customer loyalty (Sheth et al., 2011). Challenges encompass ensuring supply chain sustainability and the need for continuous innovation in product offerings to meet environmental goals without compromising quality.

Sustainable development is increasingly recognized as a pivotal aspect of business operations, driven by regulatory pressures, market demands, and the intrinsic value of corporate responsibility. The benefits of adopting sustainable development practices are manifold, including operational efficiencies, reduced costs through energy conservation, and the positive impact on the community and environment (Bansal, 2005). The main challenges include integrating sustainability into core business strategies and the investment required to transition to more sustainable operations.

The Base of the Pyramid (BoP) approach is gaining traction as a driver for inclusive business models that address the needs of underserved populations. This strategy offers advantages such as tapping into new markets, fostering innovation, and contributing to poverty alleviation (Prahalad & Ramaswamy, 2004). However, it faces challenges such as understanding and adapting to the unique needs of BoP consumers, ensuring affordability and accessibility, and building sustainable stakeholder cooperation to achieve mutual benefits.

From the economic perspective, there are local ingredients that reduce operational costs and gain independency as the drivers. Utilizing local ingredients not only supports the local economy but also reduces transportation and overall operational costs. This approach is consistent with the Resource-Based View (RBV), which emphasizes leveraging local resources for competitive advantage (Barney, 1991). By aligning with the principles of the RBV and strategically utilizing local resources, businesses can enhance their operational efficiency, reduce costs, and differentiate themselves in the market. This approach not only supports economic independence by reducing reliance on external suppliers but also contributes to the sustainability of local economies and communities.

Ultimately, by embracing the RBV and focusing on local ingredient sourcing, businesses can strengthen their competitive position and achieve long-term success in the marketplace (Zahra, 2021).

Research suggests that formalized contracts can enhance supply chain sustainability and accountability. Formal agreements that include clearly defined penalties for non-compliance can incentivize suppliers to adhere to sustainability standards and delivery commitments (Gimenez & Tachizawa, 2012). Furthermore, written contracts provide legal recourse and a framework for dispute resolution, reducing the potential for misunderstandings and conflicts (Wuttke et al., 2013). While informal relationships built on trust are valuable, incorporating formal contractual mechanisms can strengthen the overall sustainability of supply chain operations.

Underpinning these efforts is stakeholder cooperation through collaboration with local suppliers and community engagement, which is vital for the base of the pyramid's success. This collaborative approach is in line with the stakeholder theory, which posits that businesses should consider the interests of all stakeholders, including local communities, in their decision-making processes (Freeman, 2015). Overall, these circular practices demonstrate food businesses' commitment to balancing ecological responsibility, social impact, and economic viability, consistent with the triple bottom-line principle of sustainability (Elkington, 1998).

5. Conclusion

The transition towards a circular economy in the food service industry represents a crucial step in mitigating environmental impact and promoting sustainable practices. This study delves into the experiences of Indonesian Micro, Small, and Medium Enterprises (MSMEs) within this sector, uncovering the various drivers, benefits, and challenges they encounter in implementing circular economy practices. Key findings highlight the importance of local sourcing as a strategic approach for businesses to improve supply chain efficiency, minimize environmental footprint, and bolster local economies. Additionally, the adoption of sustainable packaging, efficient waste management practices, and strengthening partnerships with suppliers are identified as pivotal elements for the successful incorporation of circular principles. Nevertheless, the research also brings to light several hurdles faced by these entities, including issues concerning supplier standardization, quality assurance, and educating employees on proper waste segregation, underscoring the necessity for ongoing refinement, creativity, and stakeholder engagement to navigate obstacles and propel the food service industry towards sustainability.

This body of work enriches the existing literature on circular economy applications within the food service realm, offering insightful perspectives for enterprises, policy-makers, and scholars alike. It lays down a foundation for crafting strategies and regulations that support the circular economy shift while pinpointing areas ripe for further inquiry and cooperation. The call for expanded research includes broader geographic and contextual studies for a more holistic understanding of circular economy adaptations, longitudinal analyses to gauge long-term impacts, exploration of technology's role in streamlining circular practices, assessment of policy effectiveness, and the potential of cross-sector collaborations. Addressing these research gaps will not only deepen our comprehension of circular economy dynamics in the food service sector but also guide the formulation of robust approaches and policies fostering a sustainable and resilient food system.

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Green Banking Disclosure in Indonesia: Do Financial Performance and Board Characteristics Matter?

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Abstract
Green banking is an environmentally responsible practice within the banking business, despite its classification as a non-environmentally sensitive sector. Commercial banks can actively promote green banking initiatives by investing in emission-reducing technologies and providing loans to sectors with minimal greenhouse gas emissions. This article seeks to examine the impact of bank financial performance, board size, board independence, and board diversity on green banking disclosure. This study applied panel data regression to a sample of forty-three banks listed between 2019 and 2022, demonstrating that these banks' financial performance influences the level of transparency in green banking. The capital adequacy ratio (CAR) has a positive impact on green banking disclosure, whereas non-performing loans (NPL) and the loan-to-deposit ratio (LDR) have a negative impact. The size of board commissioners, board independence, and gender diversity do not correlate with green banking disclosure. The results suggest that banks with strong financial performance, i.e., higher capital and lower non-performing loans, have more resources to participate in the green banking activities disclosed in the sustainability report. The negative relationship between LDR and green banking disclosure indicates that the careful selection of loan distribution to businesses that care about the environment will increase green banking disclosure but decrease LDR. This study informs the Financial Service Authority (OJK) that, in order to promote sustainable finance in the banking industry, the OJK should oversee banks' financial health.

Keywords: Green Banking, Green Banking Disclosure, Sustainable Finance, Financial Performance, Board Characteristics

1. Introduction

Climate change due to global warming is the hottest issue in the world these days. The Copernicus Climate Change Service (C3S) (2024) of the European Union released a report stating that the unprecedented increase in global temperature since June 2023 made 2023 the hottest year. The temperature in 2023 was 0,60 degrees Celsius hotter than the average temperature in 1991–2020 and 1,48 degrees Celsius hotter than the pre-industrial level in 1850–1900. According to The Ministry of Environment and Forestry of the Republic of Indonesia (2022), the potential

economic damage to four priority sectors, namely marine and coast, water, agriculture, and health, due to climate change will reach 102.36 trillion rupiahs in 2020, or equivalent to 0.61% of the 2020 Gross Domestic Product (GDP) target, and could reach 115.53 trillion rupiahs in 2024. Figure 1 depicts the projections of economic impacts due to climate change. According to the figure, climate change events directly and indirectly contribute to the national economy's decline.

Despite its classification as a non-environmentally sensitive sector, the bank, as a financial intermediary, shall take part in mitigating the impact of the increased temperature on earth. The Financial Services Authority (OJK) has already addressed climate change by promoting sustainable finance in Indonesia (Indonesian Financial Services Authority, 2014) . Sustainable finance involves incorporating environmental, social, and governance (ESG) factors into investment decisions within the financial sector. This approach promotes the allocation of funds towards sustainable economic activities and projects, resulting in long-term investments (European Commision, 2023). Financial services organizations in Indonesia are not legally required to disclose information about sustainable financing during the initial phase of the roadmap's implementation. After the implementation of OJK Regulation (POJK) Number 51/POJK.03/2017, financial service businesses, specifically those categorized as Commercial Bank Business Category (BUKU) 3, BUKU 4, and Foreign Banks, were required to disclose their sustainable financing practices starting January 1, 2019 (Indonesian Financial Services Authority, 2017). Before obligatory requirements, the proportion of financial service institutions that engaged in sustainability reporting was minimal, amounting to approximately 9% (Rahayu & Djuminah, 2022).

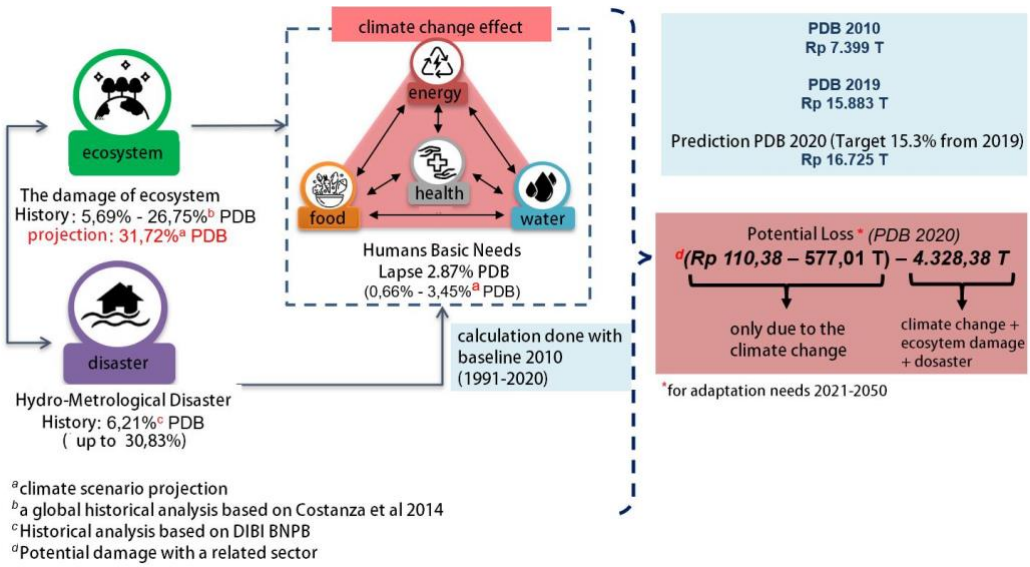

Figure 1: The Projection of Economic Impact Due to Climate Change
Source: The Ministry of Environment and Forestry of the Republic of Indonesia (2022)

Some researchers have investigated factors associated with the level of sustainability reporting in the banking industry or the disclosure of green banking practices. In the international arena, Cosma et al. (2022), for example, find that European banks have achieved an adequate degree of compliance with respect to the availability of information. However, the component that requires the most development is their forward-looking mindset. The presence of a Corporate Social Responsibility (CSR) committee specifically focused on sustainability matters appears to be the distinguishing factor among banks in terms of their level of transparency. In the context of Sub-Saharan Africa banks, Adu (2022) documents that corporate governance (CG) mechanisms as reflected in the CG disclosure index have a favorable relationship with green banking practices and reporting.

Other studies investigated the role of board characteristics in explaining the level of green banking disclosure (GBD). An examination of the existing body of literature suggests that board characteristics include some aspects, namely the number of people sitting on the board (board size), board independence, board educational background,

and board gender diversity. Observing banks in Bangladesh, Bose et al. (2018) finds that board size has an encouraging effect on GBD, as does banks in ASEAN-5 countries (Cakti & Aryani, 2023). Research in Indonesia also confirms that board size, i.e. the number of commissioners, positively influences CSR disclosure (Hermawan & Gunardi, 2019) and green banking initiatives (Farida & Purwanto, 2021; Handajani, 2019). Meanwhile, Qudriyah et al. (2021) finds that the number of directors encourages sustainable finance disclosure in Sharia commercial banks in the country.

Some research on board independence, i.e., the proportion of independent directors on the board, provides conflicting results in relation to GBD. Rahayu and Djuminah (2022), who examine Indonesian listed banks, find that the increased number of independent commissions is associated with an increased level of GBD. (Hermawan and Gunardi (2019) also found similar results in the banking industry's CSR disclosures. However, Hasanah et al. (2022) find opposite results: the increased number of independent commissioners is associated with the decline of GBD.

Gender plays a significant role in the governance of organizations, as stated in the relevant literature (Mazumder & Hossain, 2023). Gender diversity refers to the presence and inclusion of female director or female commissioners on the corporate board. Numerous researches have repeatedly shown empirical evidence that supports a beneficial correlation between the inclusion of women on corporate boards and the disclosure of information. According to Buallay and Alhalwachi (2022), the presence of female board members in the range of 21% to 50% had a notable and favorable impact on the disclosure of environmental responsibility. Research by Cicchiello et al. (2021) found that sustainability reports were more likely to be favorable when there was a greater representation of women on boards.

The purpose of this study is to examine the impact of board characteristics and financial performance on the extent of GBD. The examined board characteristic variable includes some aspects, namely board size, board independence, and board gender diversity. This study, utilizing the resource dependence theory, posits that board characteristics favorably influence the extent of GBD. Similarly, banks with better financial health would provide a greater extent of GBD. This study will examine bank-specific financial indicators such as the capital adequacy ratio, the loan-to deposit ratio, and non-performing loans.

Previous studies have incorporated financial indicators as determinants of GBD, or sustainable finance disclosure (Hoque et al., 2022). However, Hoque uses general industry financial indicators like size, profitability (return on asset/ROA, return on equity/ROE), liquidity (current ratio), and leverage (debt to asset ratio) rather than industry-specific indicators for bank performance. To the best of the author's knowledge, very few studies examine bank-specific financial ratios in relation to GBD; for example, Caby et al. (2020). The study looks into how some bank-specific financial indicators affect climate disclosure and finds that the profit-to-capital ratio and the risk-weight asset (RWA)-to-asset ratio affect climate mitigation-related disclosure in both developed and developing countries. Meanwhile, the majority of previous studies in Indonesia focused solely on profitability (Rachmawati et al., 2023), ROA and size (Hasanah et al., 2022; Rahayu & Djuminah, 2022), and ROE, leverage, and size (Hermawan & Gunardi, 2019). Therefore, the current study contributes to the literature by examining bank-specific financial indicators in an Indonesian context.

The extent to which a bank discloses its climate-impact information is based on legitimacy theory. The idea that businesses and communities have an implicit agreement is central to legitimacy theory (Miah et al., 2021). Since the former party has reaped many benefits from the later party's provision of goods and services under this agreement, it has an ethical and moral obligation to give back to society (Farache & Perks, 2010). Therefore, more well-known businesses should act responsibly toward society. Companies also need to prove themselves by disclosing their climate-related activities (Patten, 2002).

The emergence of resource dependency theory aimed to offer an alternate viewpoint for recognizing various forms of inter-organizational linkages (Zaid et al., 2019). What distinguishes this philosophy from others is its emphasis on tactics. For example, when a company depends solely on one resource, it may require the use of alternate resources. Pfeffer and Salancik (2015) argue that in order to survive and maintain competitiveness, organizations

must have resources. Zaid et al. (2019) have shown the importance of varying the structure of human resources in order to ensure the survival of enterprises. Companies can get a competitive edge by having distinctive and superior resources that contribute to long-term success. The mix of board members is characterized by various experiences, perspectives, and connections, which enable organizations to recognize and capitalize on opportunities (Arayssi et al., 2020). Implementing green banking practices and disclosure can improve a company's market performance by positioning it as a socially conscious and contemporary corporation.

2. Method

2.1 Sampling Techniques

There were forty-seven commercial banks listed on the Indonesia Stock Exchange (IDX) as of December 31, 2022 who produced sustainability reports. Then we select the sample based on the availability of the annual report and sustainability report during the observation period consecutively (2019–2022). There were four banks whose annual and sustainability reports were incomplete. Hence, the final sample consists of 43 banks, resulting in 172 bank observations.

2.2 Dependent Variable

This research's dependent variable is GBD. This study utilizes Bose's et al. (2018) green banking reporting index, which comprises 21 statements of disclosure. This study uses an unweighted index of disclosure to score the GBD (Bose et al., 2018; Khan et al., 2013; Widagdo et al., 2022). If a bank's sustainability report includes information on their green initiatives, they will receive a score of 1, and if it does not, they will receive a score of 0. Then, we calculated each sample banking firm's overall GBD score by dividing their total disclosure score by the maximum disclosure that the firm might have revealed. The ultimate form was a percentage. A greater GBD score, which recorded information about green banking activities numerous times, meant that there was a higher level of green banking activity.

2.3 Bank Financial Performance

This study's independent variables are bank financial performance and board characteristics. There are three financial ratios, namely the capital adequacy ratio (CAR), the loan-to-deposit ratio (LDR), and the non-performing loan (NPL), as proxies for bank financial performance.

The CAR measures the proportion of a bank's capital in relation to its risk-weighted assets. A bank uses the CAR as a metric to evaluate its ability to manage all risks associated with its earning assets, particularly loans (Ika et al., 2023). According to Raharjo et al. (2014), banks must allocate a portion of their total earning assets as capital. All commercial banks operating in Indonesia are currently required by the Indonesian Central Bank Regulation to maintain a minimum capitalization of 8% of their risk-weighted assets (Indonesian Central Bank 2013). Frequently, banks maintain capital ratios in excess of the statutory minimum in order to expand their loan activity. The rate differential between loans and deposits will cover its own expenses, enabling the maintenance of larger capital ratios at a minimal cost (Islam, 2014).

This study uses the LDR as the primary metric to evaluate a bank's liquidity. To calculate the LDR, divide the entire loan amount by the total deposit amount (Ika et al., 2023). Within this particular framework, loans are specifically characterized as funds deposited into a traditional financial institution. This study may deduce that a bank with a low loan-to-deposit ratio (LDR) has a surplus of liquid assets, which could lead to lower profits, making it less risky than a financial institution with a higher LDR. Nevertheless, a LDR indicates that a bank has heightened its financial strain through excessive lending. This also indicates the potential risk that the bank may need to sell specific loans at a loss in order to fulfill depositor claims. A high LDR number signifies a reduction in liquidity (Islam, 2014).

The NPL is defined as the ratio of non-performing loans to the total number of loans. The inherent nature of each bank's commercial activities sometimes refers to the banking sector as a high-risk industry. As banks typically act as middlemen, their primary concern is credit risk. The NPL ratio serves as a proxy for assessing credit risk. Consequently, when NPL increase, so does the level of risk for a bank (Islam, 2014).

2.4 Board Characteristics

There are a few proxies for measuring board characteristics. The first proxy is the size of the board of commissioners (BOCS), which refers to the total number of commissioners in the company. The second proxy is the size of the board of directors (BODS), which represents the total number of directors in the company. According to the OJK regulation, a bank shall have at least three directors and three commissioners (Indonesian Financial Service Authority, 2023). The third factor is board independence (BI), which refers to the ratio of independent commissioners to the total number of commissioners within the company. According to the OJK regulation, at least fifty percent of board commissioners are independent (Indonesian Financial Service Authority, 2023) . The fourth proxy is board gender diversity (BG), which refers to the presence of a female director or commissioner on the board.

2.5 Research Model and Data Analysis

To scrutinize the effect of financial performance and board characteristics on green banking disclosures, the current study employs panel data regression. The panel data regression is suitable since the study utilizes a balanced bank-year observation. The following is how the study displays the regression model:

$$GBD = \alpha + \beta 1CAR + \beta 2LDR + \beta 3NPL + \beta 4BOCS + \beta 5BODS + \beta 6BI + \beta 7BG + \varepsilon \quad (1)$$

Where, Table 1 presents the identification of the aforementioned variables.

Table 1: Proxies of Variables

No	Variable	Measurement	Source
1	Green Banking Disclosures (GBD)	$GBD_a = \frac{\sum item\ that\ revealed}{21}$ x 100%	(Bose et al., 2018)
2	Capital Adequacy Ratio (CAR)	CAR= $\frac{Total\ Equity}{Assets\ weighted\ by\ risk} x100\%$	(Islam, 2014) (Ika et al., 2023)
3	Loan to Deposit Ratio (LDR)	LDR= $\frac{Total\ Loan}{Total\ Deposit} x100\%$	(Amidjaya & Widagdo, 2020)
4	Non-Performing Loan (NPL)	NPL= $\frac{The\ amount\ of\ non-performing\ loan}{Total\ loan\ given} x100\%$	(Caby et al., 2020)
5	Boards of Commissioner Size (BOCS)	BOCS = ∑BOC The number of commissioners	(Farida & Purwanto, 2021)
6	Boards of Director Size (BODS)	BODS = ∑BOD The number of directors	(Hasanah et al., 2022)
7	Board Independence (BI)	BI= $\frac{The\ amount\ of\ independent\ commissioners}{The\ total\ of\ \text{commissioners}}$ x 100% The proportion of independent commissioners	(Rahayu & Djuminah, 2022)
8	Board Gender Diversity (BG)	a dummy variable that has a value of 1 when there is a woman on the board and 0 when there are only men.	(Cakti & Aryani, 2023)

3. Results and Discussions

3.1 Descriptive Statistics

Table 2 exhibits the description of the research data, which comprises the lowest, highest, median, average value, and standard deviation. As displayed in the table, the lowest disclosure of green banking is 24%, while the highest is 100%, and the average of GBD is about 55%. This study documents a higher GBD level than the previous study, which observed Islamic banks at 44% (Farida & Purwanto, 2021) and public listed banks at 39% (Firmansyah & Kartiko, 2024), using the same measurement of GBD (Bose et al., 2018).

Table 2: Descriptive Statistics

Variables	Mean	Median	Max	Min	Std. Deviation
GBD	54.74	52	100	24	17.62
CAR	35.01	24.40	283.38	9.01	32.48
LDR	86.98	81.97	355	12	37.75
NPL	1.64	1.21	5.64	-3.32	1.39
BOCS	4.95	4	14	1	2.36
BODS	6.62	6	17	3	2.79
BI	61.87	42.52	100	33.3	20
N	428	6.35	4.16	8.33	0.75

Source: Authors' compilation

Table 2 shows that the CAR ranges from 9% to 283%, with 35% on average. The number suggests that the sample banks' CAR has complied with Indonesian Central Bank regulation, which stated a minimum of 8%. On average, the LDR is 87%, with the minimum at 12% and the maximum at 355%. If the ratio is excessively high, it indicates that the bank may lack sufficient liquidity to meet unexpected money demands (Caby et al., 2020). The NPL ratio is 1.644% on average, which ranges from -3.32% to 5.64%. A high ratio signifies the bank's increased risk of financial loss if it fails to collect the outstanding sums, whereas a low ratio implies that the outstanding loans pose minimal risk to the bank (Ika et al., 2023; Islam, 2014).

Table 2 shows that the sample banks have 5 commissioners and 7 directors on average. Meanwhile, the proportion of independent commissioners is about 62% on average, with the lowest and highest proportions being 33% and 100%, respectively. The average number of independent commissioners has followed the OJK Regulation, which requires a minimum of 50% of independent commissioners (Financial Services Authority, 2023). In terms of the existence of women on board (not presented in Table 2, as it is a frequency of descriptive statistics), four banks (9.31%) have no women on board, while the remaining 90.69% of the sample banks have female directors or commissioners on board. The data indicates that Indonesian commercial banks place women in a strategic position.

3.2 Panel Regression Results.

Table 3 displays the results of panel regression to test the influence of bank financial performance and board characteristics on the level of GBD. This study utilizes the cross-section random effects model after carefully observing the most suitable model in the panel regression analysis. As shown in the table, the CAR ratio is positively correlated with the level of GBD. The results indicate that banks with a higher CAR ratio possess more funds to manage green banking initiatives, leading to increased disclosure in their annual sustainability reports.
Table 3 also demonstrates that both LDR and NPL are negatively associated with GBD levels. A bank with a lower NPL is likely to have more resources to engage in environmentally friendly business action, resulting in a higher level of GBD. Our results are inconsistent with those of Caby et al. (2020), who found that NPL has no relationship with climate-related risk disclosure in the banking industry in selected countries, both developed and developing nations.

LDR has an unfavorable relationship with the extent of GBD. Hence, banks with a high LDR are less likely to take part in green banking activities, and vice versa, banks with a lower LDR are more likely to have a higher

incentive to take part in green financing projects and green banking activities. This is particularly true when there are numerous borrower or debtor companies with environmental business concerns. The results are similar to those of Caby, who found a negative association between LDR and climate risk-related disclosures in the same industry in a number of countries. However, our results contradict those of Amidjaya and Widagdo (2020), who documented that LDR has no relationship with the sustainability disclosure of listed banks in IDX.

Table 3: Results of OLS Regression

Variables	Coefficient	t-Statistic	Prob
Constant	0.459	8.732	0.000
CAR	0.001	3.165	0.002***
LDR	-0.0008	-2.839	0.005***
NPL	-0.016	-2.889	0.004***
BOCS	0.007	1.092	0.276
BODS	0.010	1.809	0.072*
BI	0.025	1.442	0.151
BG	0.004	0.176	0.860
R-squared		0.190	
Adjusted R-squared		0.160	
F-statistic		5.499	
Prob (F-statistic)		0.000	
Durbin-Watson stat		1.092	

The symbols *, **, and *** represent the statistically significant results at the significance levels of 10%, 5%, and 1%, respectively.

Source: Authors' compilation

In terms of board characteristics, variables such as board size, board independence, and board gender diversity all have a negligible impact on GBD. However, this study finds a marginally significant relationship between BODS and the extent of GBD, indicating that an increased number of directors in a bank tends to improve the level of green banking initiatives disclosed in the sustainability report. In Indonesia's banking industry, the favorable relationship between director size and climate change-related disclosure is similar to that of Hasanah et al. (2022) who assert that the size of directors tends to improve the money spent on sustainability finance in the country. Although the output shows a marginally significant relationship, the favorable association between director size and green banking disclosure supports the resource-dependent theory that a larger board can increase the available resources. Members of the board with different backgrounds and experiences can help with a variety of critical tasks, revealing potential unpredictability and reliance (Ali et al., 2022; Ghabayen et al., 2016). The results also confirm the OJK regulation that there should be a minimum number of directors (three persons) required to maintain business operations in a bank, since directors represent the human resource capacity to run a business.

4. Conclusion

The purpose of this article is to examine the relationship between bank financial performance, board characteristics, and disclosure of green banking activities. The results, derived from panel data regression on 172 bank-year observations, indicate that the bank's financial stability influences the level of transparency in green banking. The capital adequacy ratio has a positive impact on green banking disclosure, whereas non-performing loans and loan-to-deposit ratios have a negative impact. The findings point out that banks that exhibit healthy financial performance, characterized by raised capital levels and fewer non-performing loans, have greater capacity to engage in the green banking initiatives outlined in the sustainability report. The inverse correlation between loan-to-deposit ratio and green banking disclosure suggests that strategically allocating loans to environmentally conscious enterprises will lead to higher levels of green banking disclosure but lower levels of loan distribution. This is especially true when there are more lenders with unsustainable business environments. This study advises the OJK to monitor banks' financial healthiness in order to encourage sustainable finance in the banking sector. Future research may enhance the low level of adjusted R-squared, which this study acknowledges as a limitation. Adding some variables, such as the effectiveness of the committee audit and ownership structure, will be an interesting research avenue.

Author Contributions: All authors work equally to finish the research report. Citraningtyas designs the research, as well as keying in the data. Ika not only analyzes and interprets the research data, but also composes the initial draft of the research article. Widagdo validates the conceptualization, conducts a literature review, and revises and edits the initial draft preparation. Widagdo is also in charge of project administration and research funding.

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Effect of Representativeness Bias, Availability Bias and Anchoring Bias on Investment Decisions

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Abstract
This study aims to determine the effect of three types of financial behavioral bias, namely representativeness bias, availability bias, and anchoring bias on investment decisions. This study uses a quantitative method with a purposive sampling technique. Data were collected through questionnaires and analyzed using Structural Equation Modeling (SEM) with the help of SmartPLS 3.0 software. The results of the study show that the two types of financial behavioral bias have a significant effect on investment decisions which are the representativeness bias and the availability bias on investment decisions, while anchoring bias does not have an effect on investment decisions. This research can contribute to investors to better understand the effect of financial behavior bias on investment decisions and to take wiser actions in investing.

Keywords: Behavioral Finance, Investment Decision, Financial Bias

1. Introduction

Since decades ago, the traditional financial model has dominated the financial sector. Traditional finance, also known as standard finance, is based on theories and principles that assume that investors behave rationally. Within this framework, the focus is given to models that take into account the assumptions of rationality. Some of the theories that form the basis of traditional finance include the arbitrage principle of Modigliani and Miller, the portfolio principle of Markowitz, the theory of capital asset pricing by Sharpe, Lintner, and Black, and the efficient market hypothesis put forward by Fama. In this view, the market is considered efficient and investors are considered to behave rationally in making investment decisions. In essence, traditional finance emphasizes the importance of the information included in the price of financial assets and investors seek to avoid risk by considering the tradeoff between return and risk. However, recurring financial crises and unanswered stock market anomalies have called into question the hypotheses of market efficiency and investor rationality. In 1979, Daniel Kahneman and Amos Tversky issued their important work entitled "Prospect Theory: An analysis of decision under risk", in which they criticized the expected utility theory as a model describing decision making in risk situations and developed an alternative model known as as Prospect Theory. This theory explains the irregularities

in human behavior when assessing risk in uncertain situations. They rejected the idea of an efficient market and investors who were always rational and consistently risk averse, thus paving the way for the development of a new academic discipline, namely Behavioral Finance.

Daniel Kahneman, a psychologist, and Vernon Smith, an economist, are recognized as major figures in the development of behavioral finance and received the Nobel Prize in Economics in 2002. Kahneman examines how humans evaluate and make decisions in situations full of uncertainty, while Smith studies market mechanisms through experimental research. Behavioral finance combines aspects of psychology and economics to explain why and how people make irrational and suboptimal financial decisions, and the impact these decisions have on market efficiency, individual wealth, and corporate performance. This approach emphasizes that the investment decision-making process is influenced by various unavoidable behavioral biases, and that the human mind uses shortcuts and emotional filters even in the context of investment decisions. In this context, the psychological dimension in behavioral finance has a significant influence on the process of making investment decisions. Rather than relying on a universal theory of investment behavior, research in behavioral finance has relied on widespread evidence demonstrating human ineffectiveness in making economic decisions in a wide variety of decision-making situations. Initially, the traditional field of finance may have been reluctant to accept the views of psychologists, but it has since succeeded in providing explanations for several reasons why investors often deviate from making rational financial decisions and why sudden and unpredictable stock price fluctuations occur. Research has revealed that some irrational behavior in the market includes over trading, buying and selling of stocks without considering their fundamental value, making decisions based on the stock's past performance and what other people are doing in buying and selling, and the habit of holding on to losing stocks while selling. profitable stock. Some of the behavioral biases that have been studied include overconfidence, disposition effects, representativeness, retention, availability, herd behavior, and propensity bias towards local assets.

One form of behavioral bias that exists in financial behavior is a heuristic bias. Heuristics are rules of thumb that support investors to make decisions only in complex and uncertain situations (Ritter, 2003). The various types of methods adopted by investors to reduce the effort associated with their task are referred to as heuristics. Representativeness bias, availability bias, anchoring bias, and overconfidence bias are some important forms of heuristics. (Subramaniam & Velnampy, 2017). Kahneman and Tversky (1974) show that humans tend to classify events as representatives of familiar categories, and this type of bias is known as representative bias. Availability bias occurs when investors evaluate the frequency of a category or the probability of an event based on how easy the example or event is to remember (Tversky & Kahneman, 1974). Anchoring is the tendency for investors to rely too heavily on one trait or information when making investment decisions. (Lord, Ross and Lepper, 1979). By looking at this background, the researcher is interested in conducting further research which aims to determine the effect of representative bias, availability bias and anchoring bias.

2. Literature Review

2.1. Behavioral Finance

Behavioral finance is defined as the study of the impact of psychological and cognitive factors on the decision behavior of financial practitioners and their subsequent effects on markets (Javed et al., 2017). In their early publications on bias and heuristics, Tversky and Daniel Kahneman (1972) identified three main types of heuristics, namely brief thinking strategies: the representativeness heuristic, the availability heuristic, and the adjustment and containment heuristic. According to them, these heuristics provide an explanation for the emergence of biases and errors in judgment and decision making, which may violate normative principles or axioms. In behavioral finance, it is assumed that investment decisions can be irrational due to several factors, such as limited imperfect information, limited rationality, anomalies, use of basic heuristics, and behavioral and psychological biases (Shah et al., 2018). In addition, the role of investors' mental status is also an important factor in understanding irrational decision-making processes. Investors often use behavioral heuristics to simplify their decision-making process, which can produce systematic errors in judgment and lead to satisfactory investment choices, but do not achieve maximum utility (Kahneman & Tversky, 1979). Heuristic biases such as representativeness, availability, overconfidence, and anchoring are used by investors to reduce the risk of loss in uncertain situations. When

individual investors use this heuristic, they reduce mental effort in the decision-making process (Shah et al., 2018). However, this can also lead to errors in judgment, and as a result, investors can make the wrong investment decisions. This wrong decision can lead to market inefficiencies.

2.2. Investmend Decision

The process of making investment decisions involves making choices regarding the allocation of funds to achieve the desired investment returns. This includes deciding which assets to invest, how much to invest, and when to buy or sell assets. Investment decisions are influenced by a variety of factors, including financial goals, tolerance for risk, market conditions and personal biases. Investors can use a variety of methods to analyze a potential investment, such as fundamental analysis, technical analysis or a combination approach. Ultimately, the goal of making investment decisions is to achieve maximum profit by reducing risk as much as possible. However, studies over the past two decades have highlighted the behavioral phenomena of investor psychology related to perception, memory, and non-conscious thoughts (Dangol & Manandhar, 2020). Hilton (2001) and Baker & Nofsinger (2002) stated that behavior explained through the thoughts and feelings of investors can change the decision-making process from initially rational to irrational. Behavioral finance assumes that in making investment decisions, there is a possibility of irrationality (Shah et al., 2018). This can be caused by limitations of imperfect information, limitations in rationality, the existence of anomalies, the use of basic heuristics, and the presence of psychological or behavioral biases. In addition, investors' mental status also plays an important role in understanding why irrational decision making occurs.

2.3. Representative Bias

Representative bias is a form of cognitive heuristic bias which can be explained as a brief thinking strategy that involves making decisions based on mental stereotypes (Shefrin, 2005). Representativeness can be defined as the extent to which an event has something in common with its parent population. In other words, representativeness reflects the extent to which an event represents the general population. There are two types of representativeness bias, namely baseline level neglect and sample size neglect. Baseline neglect means that decision makers ignore irrelevant or inaccurate information when evaluating the likely return of a particular investment. In other words, they tend to rely on stereotypes when making investment decisions, without adequately considering the possible basis for emerging stereotypes (Pompian, 2006). Many studies have been conducted on the relationship between representativeness bias and investment decisions. Some of these studies show a positive relationship between representativeness bias and improvements in investment decisions. That is, because of the representation bias, the investment decision is better. Elhussein & Abdelgadir (2020) investigate behavioral finance by investigating the impact of behavioral biases on individual investment decision making in a developing country's stock market, the Sudan Stock Exchange Market. This paper finds that representative bias has a significant impact on individual investment decision making at the Khartoum Stock Exchange. Alrabadi, et al (2018) also conducted research which found that representative bias has a significant effect on investment performance. Meanwhile, Dangol & Manandhar (2020) investigated the effect of representativeness bias in making investment decisions and its relationship with the level of irrationality in making investment decisions. This paper presents a conceptual framework that includes representativeness bias as one of the four heuristic biases that influence investment decision making.

2.4. Availibility Bias

Availability bias occurs when decision makers rely on available information (Siraji, 2019). This refers to the tendency of people to judge the likelihood of an event based on the degree to which they easily remember similar events. In other words, they are more likely to give more weight to currently available information than to process all relevant information. This can lead to an overestimation of the likelihood of certain events occurring, which in turn can lead to sub-optimal investment decisions. For example, an investor may be swayed by a recent news report or social media post about a stock, without considering other factors that may affect the stock's performance. Research has shown that availability bias can have a negative impact on investment decisions, along with other biases such as overconfidence bias, herding bias, anchoring bias, and representativeness bias. Therefore, it is

important for investors to be aware of the existence of these biases and take steps to reduce their impact on the investment decision-making process. In the same study, Elhussein & Abdelgadir (2020) and Alrabadi, et al (2018) found that the availability bias has a significant effect on investment decisions. Ikram (2016) conducted research to explore the influence of the factors that influence the trading decisions of individual investors on the Islamabad Stock Exchange. The results of this study indicate that the existence of an availability bias has a positive impact on their investment decisions. In other words, the presence of such availability bias contributes to the increased returns earned by individual investors.

2.5. Anchoring Bias

Kahneman and Tversky (1974) explain that Anchoring is a strategy used in situations where people make estimates or estimates by referring to certain initial values. This approach tends to affect the final estimate, because different initial values may result in different estimates. Anchoring bias refers to the tendency of investors to use stock price levels that are not logically relevant as a basis for their decision making (Jain et al., 2020). Investors affected by this bias tend to set buy and sell prices for stocks based on past information. This method is actually not the right method, so investors buy stocks when prices go up or sell when prices are down. Anchoring bias is also related to representativeness because it indicates that investors' decisions are influenced by recent experience, where they tend to be more optimistic when the market is rising and more pessimistic when the market is down (Waweru et al., 2008). Various studies have also been conducted to investigate the effect of anchoring bias on investment decisions. Subramaniam & Velnampy (2017) found that anchoring bias is one of the factors influencing the investment decisions of household investors in the Northern Province of Sri Lanka. The initial model of the Behavioral Finance-Based Investment Decision construct has Anchoring as one of eight factors. (Dangol & Manandhar, 2020) examines the impact of anchoring bias on investment decision making and its relationship to the level of irrationality in investment decisions. The conceptual framework presented in this paper includes anchoring and adjustment biases as one of the four heuristic biases that influence investment decision making.

2.6. Conceptual Framework

This research framework aims to examine the effect of representativeness bias, availability bias and anchoring bias on investors' investment decisions in financial markets. In this context, representativeness bias refers to a short thinking strategy that involves making decisions based on mental stereotypes, whereas availability bias occurs when decision makers rely on available information and anchoring bias is a strategy used in situations where people make estimates or estimates by referring to at a certain initial value. This research framework is based on behavioral finance theory which recognizes that the behavior and psychological attitudes of investors can influence their investment decisions. The independent variables in this study are representativeness bias, availability bias, anchoring bias and the dependent variable is the investment decision.

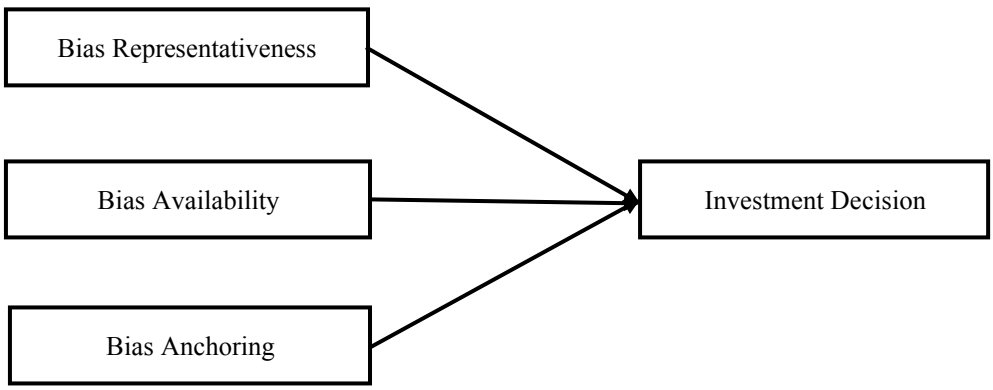

Figure 1: Research Framework

Thus, the hypotheses of the study are:
H1: Representativeness bias has a significant effect on investment decisions in the Indonesian Capital Market
H2: Availibility bias has a significant effect on investment decisions in the Indonesian Capital Market
H3: Anchoring bias has a significant effect on investment decisions in the Indonesian Capital Market

3. Method

This research is descriptive quantitative research that uses primary data directly obtained from the research subjects. In this study the quantitative method was used to examine the effect of Representative Bias, Availability Bias, and Anchoring Bias on Investment Decisions. In this study, the research variables are discussed in stages, starting with the dependent variable which is the central theme, and then continuing with a discussion of the independent variables. There are dependent variables and independent variables in this study. The dependent variable, also known as the dependent variable, is the variable which is functionally affected by the independent variable. In quantitative research, the dependent variable is the main focus and center of attention for researchers (Wahyudin, 2015). The dependent variable in this study is investment decisions. Independent variable (X) in the form of representativeness, availability & anchoring. In this study, the Structural Equation Modeling (SEM) method was used as a data analysis technique. Data processing uses smartPLS v3.0 software. SEM method is used to overcome the weaknesses contained in the regression method. This method was chosen because the variables examined in this study are latent variables. Partial Least Square is the most powerful analysis method which in this method is not based on many assumptions. Partial Least Square (PLS) can be used to explain the relationship between latent variables. PLS is able to analyze construct models formed from reflective and formative indicators, so indicators can be based on theory or adopt indicators that have been used by previous researchers. This method is categorized as non-parametric, so it does not require data that has a normal distribution in the Partial Least Square model. The use of Partial Least Square aims to predict the relationship between constructs, helping researchers in their research to identify latent variables related to the desired predictions (Ghozali, 2014).

4. Results

4.1. Descriptive Analysis

Based on the data gathered through the questionnaire the majority respondents are college students with 53% percentage followed by employees with 24% share. Meanwhile, based on age the majority are respondents at < 25 years old with 58% and between 25-40 years old with 38%.

Table 1: Respondent Descriptive Profile

Characteristic		Frequency	Percentage
Gender	Male	49	37%
	Female	51	63%
Age	≤ 25 tahun	58	58%
	> 25 - 40 tahun	38	38%
	> 40 - 55 tahun	4	4%
Occupany	Employee	24	24%
	Professional	6	6%
	Entrepreneur	7	7%
	Student	53	53%
	Civil Servants	7	7%
	Other	3	3%

4.2. Partial Least Square

The outer model is used in analyzing the relationship between indicators and constructs. It is also used to ensure the validity and reliability of the data used. Tests were carried out using Composite Reliability (CR), Average Variance Extracted (AVE) and Alpha Cronbach.

Table 2: Composite Reliability, Cronbach's Alpha & AVE

Variable	Composite Reliability	Cronbach's Alpha	AVE
Representativess	0.911	0.877	0.674
Availability	0.895	0.855	0.631
Anchoring	0.873	0.802	0.634
Investment Decision	0.865	0.808	0.565

The AVE value for all variables ranging from ordinary representative, availability bias, anchoring bias and investment decision has a value of more than 0.5, which is acceptable. While the value of composite reliability is at an acceptable level, which is more than 0.7.

Table 3: Hypothesis Testing

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics	P Values
Anchoring -> Investment Decision	0.201	0.205	0.109	1.848	0.065
Availability -> Investment Decision	0.248	0.268	0.092	2.700	0.007
Representativeness -> Investment Decision	0.387	0.391	0.098	3.952	0.000

Based on the test criteria, exogenous variables have a significant impact on endogenous variables if the t-statistic value exceeds 1.96. In terms of the relationship between representativeness bias and investment decisions, the t-statistic value is 3,952. Therefore, it can be concluded that H1 is proven and representativeness bias has a very significant influence on investment decisions. Meanwhile, the value of the t-statistic in the relationship between availability bias and investment decisions is 3.952, indicating that availability bias has a significant effect on investment decisions, so that H2 can be accepted. In addition, anchoring bias has a t-statistic of 1.848 so that anchoring bias does not have a significant effect on investment decisions.

5. Discussion

5.1. The Effect of Representativeness Bias towards Investment Decision

Investment decisions are directly influenced by representativeness bias with a p-value of 0.000. This study shows that representativeness bias has a significant influence on investment decisions. This is also in line with some of the investment results that have been made. However, it is different from what has been done by Suci Sudani & Putri Pertiwi (2022) who found that representativeness bias does not have a significant effect on investment decisions. Similar to that produced by Shah et al. (2018)

5.2. The Effect of Availability Bias towards Investment Decision

Investment decisions are directly influenced by availability bias with a p-value of 0.007, which means it is lower than the significance value of 0.05. This study shows that the availability bias has a significant influence on investment decisions. The results of this study are in line with previous studies. As research conducted by Shah et al. (2018).

5.3. The Effect of Anchoring Bias towards Investment Decision

Investment decisions are indirectly influenced by Anchoring Bias with a p-value of 0.065, which means that it is higher than the alpha significance value of 5%. This study shows that anchoring bias does not have a significant effect on investment decisions. The results of this study are not in line with research conducted by Shah et al., (2018) which found that anchoring bias has a significant effect on investment decisions.

6. Conclusion

This study found that representativeness bias and availability bias have a significant influence on investment decisions. Previous studies have found that representativeness bias and availability bias can negatively affect investment decisions where the decisions taken produce investment returns that are detrimental to investors. In contrast to other studies, the variable anchoring bias does not have a significant influence on investment decisions. The results of this study have contributed to the body of knowledge in financial management science, especially in financial behavioral theory. The results of this research can also contribute to the world of investment, especially in the capital market.

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The Effect of Digital Transformation on Saudi Economics Growth

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Abstract
The study measures the effect of digital transformation on Saudi Arabia's economy from 2001 to 2022. Descriptive-analytical and econometrics models are used through E-views to achieve this goal. Linear regression was used to test the model, and unit root "Dickey-Fuller" was used to test the durability of the study, co-integration of the "Johansson" validation model, and causality test of Granger; this shows an inversely significant relationship between the number of operations in sales points (POS) and the gross domestic product (GDP). A parallel relationship exists between fixed broadband subscriptions (BS), gross fixed capital formation (GFCF), and labor force (L). The study shows that the dependent variables, the number of POS, BS, GFCF, and L, are all significant factors for the independent variable, GDP, caused by forming an integration relationship between the long-term and short-term. Also, there is a two-way reciprocal causality relationship between GDP and POS and a one-way reciprocal causality between GDP and BS, GFCF, and L. The study recommends improving telecom infrastructure to increase the speed of Wi-Fi and make it available in each location at a low cost.

Keywords: Digital Economy, Digital Transformation, Economic Growth, Saudi Arabia

1. Introduction

The acceleration world is undergoing a revolution in information and communications technology (ICT), which has fundamentally altered lifestyles and the implementation of economic activities. This shift drives the economy towards a digital framework reliant on information technology and modern communications, positively affecting societal and economic interests (Al-Marhabi & Al-Bar, 2019). ICT has amplified the role of digital transformation across various sectors, enhancing worker productivity, efficiency, and competitiveness. The growth of the digital economy is closely tied to advanced technologies of the Fourth Industrial Revolution, such as artificial intelligence (AI), the Internet of Things (IoT), and cloud computing (El-Gohary & Radwan, 2023).

The COVID-19 pandemic demonstrated the importance of digital technology in achieving economic growth and overcoming the crisis that surprised countries without preparing for its challenges, as countries had no choice but to accelerate digital transformation in all fields (Osama, 2022). Countries have become dependent on digitalization,

forcing them to shift towards the digital economy as an indicator that contributes to achieving the highest economic growth rates away from the oil sector (Bassiouni, 2022).

Many previous studies have emphasized the impact of digital transformation in enhancing economic growth. Katz & Calorda (2017) concluded that with the increase in growth in per capita GDP by 0.13% for every 1% increase in digital ecosystem development indicators, the higher the level of digital transformation in a country has increased growth rate and per capita GDP (Council of Arab Economic Unity, 2021). In addition, the World Bank Report (2022) confirmed that the complete digital transformation of the economy is one of the main reasons for enhancing growth, as it can raise the per capita GDP to a rate of no less than 46% over 30 years.

In Arab countries, the digital economy's contribution does not exceed 4% of the GDP compared to the global average, which reached 22%, meaning that when taking advantage of the opportunities offered by the digital economy, the Arab world will achieve tremendous development leaps. The impact of the digital economy is estimated to be five times that of traditional methods in economic growth. According to studies and experiments, promoting economic growth is what makes it the most important accelerator of economic growth globally. (The Ministry of Digital Economy and Entrepreneurship, 2021).

Saudi Arabia launched the National Transformation Program in 2016 as the first of the Vision 2030 programs. The program aims to transform the Kingdom into a leading country ranked among the world's best.

Digital transformation is the most critical pillar of the national transformation program due to its reliance on the use and employment of modern technology that keeps pace with the digital age and the development of digital infrastructure to improve services, enhance innovation, achieve growth, increase employment opportunities, improve the quality of life of the individuals, both for citizens and residents, diversify sources of income, and enhance the digital economy (BBI website, 2024).

Because of this, improving the non-oil sector's activity is essential to diversifying the economy and creating an attractive investment environment, as Saudi Arabia aspires to raise the size of its economy to rank among the 15th in the world by 2030 (Digital Transformation Unit, MCIT).

Because the ICT sector is important for economic growth, this research is concerned with studying the impact of digital transformation on economic growth in Saudi Arabia.

2. Study Problem

Saudi Arabia is dependent on limited resources, and oil revenues have been the main source of income since the beginning of the seventies. Fluctuations in oil prices have led to instability in the Saudi economy, as oil is one of the exhaustible resources. Therefore, this will have a negative impact on the economy through its effects on oil exports and then on revenues and GDP (MCIT).

The government of Saudi Arabia has realized the importance of diversification away from oil to improve its economic strength. It has adopted national digital transformation strategies and seeks to achieve several goals, the most important of which are stimulating economic growth, creating more job opportunities, and supporting economic diversification (Abdel Hamid, 2018). Saudi Arabia launched Vision 2030 and prioritized the development of the ICT sector as one of the pillars supporting the economy. It also worked to create the appropriate environment for the technologies of the Fourth Industrial Revolution and the development of e-government. According to a digital economy report published by the Research and Information Center (2022) based on a field survey, 63.2% of participants agreed that Saudi Arabia faces the challenge of weak infrastructure for digital transformation.

Previous studies have emphasized the importance of digital transformation. Al-Sabbagh et al. (2013) studied the gross growth of the GDP per capita, which increases by 0.75% when the country's degree of digitalization increases

by 10%. Also, Baga (2019) concluded that digital transformation is one of the engines of growth in all economies, as it accelerates economic and social returns growth rate (Council of Arab Economic Unity, 2020).

As Al-Khouri (2020) explained in his study, there is a positive global certainty in the process of digital transformation on the GDP, including its per capita share, and he stated that the literature on the subject is that countries that Encourage digital transformation and be more prosperous compared to countries that fail to achieve it.

The transformation has become necessary to keep pace with global developments in the field of technology and meet the requirements of the times, thus avoiding marginalization and falling behind developed countries, as well as facing economic and social challenges (Arab Monetary Fund, 2020).

Therefore, the study problem appears in the following question:
To what extent does digital transformation impact economic growth in Saudi Arabia?

2.1 Objectives of the Study

The main goal is to measure the impact of digital transformation on economic growth in Saudi Arabia, and sub-goals fall under this primary goal are:
1. Explaining the concept of the digital economy and its importance.
2. Establish an econometrics model showing the impact of digital transformation on economic growth.
3. Highlighting the role of the digital sector in achieving economic growth.

2.2 Importance of the study

The study addresses a vital topic, which is digital transformation and its relationship to economic growth, and its importance lies in the following:

- This study is critical because it is consistent with Saudi Arabia's Vision 2030, which employs modern technologies to advance economic growth and achieve the primary goal of diversifying the economic base and building a prosperous economy.
- Digital transformation, or the digital economy, is one of the modern and essential topics resulting from the digital revolution, and many developed and developing countries are seeking to implement it, especially after the COVID-19 pandemic.
- Its importance lies in reviewing the theoretical literature on digital transformation and economic growth in Saudi Arabia.
- This study monitors the actual reality of digital transformation and studies economic growth. Therefore, the study results will help decision-makers by providing implications.

2.3 Study Hypotheses

The main hypothesis:
There is a direct relationship between digital transformation and economic growth in Saudi Arabia, and it consists of the following sub-hypotheses:

1. A statistically significant positive relationship exists between communications infrastructure (CI), an independent variable, and economic growth, as a dependent variable.
2. A statistically significant positive relationship exists between point-of-sale operations (POS) as an independent variable and economic growth as a dependent variable.
3. A statistically significant positive relationship exists between mobile phone users (MS) as an independent variable and economic growth as a dependent variable.
4. A statistically significant positive relationship exists between broadband subscribers (BS) as an independent variable and economic growth as a dependent variable.

2.4 Study Methodology

The study follows the descriptive analytical approach by reviewing the theoretical framework and previous studies within the framework of the study topic. It also follows the econometrics approach and will rely on the (E-views) program to analyze the relationship between the study variables and clarify the role of digital transformation in achieving economic growth in Saudi Arabia. During the period (2001-2022), the study conducted several tests necessary to achieve realistic results and a logical interpretation of economic variables.

The econometrics model is formulated as follows:

$$\text{GDP}=\beta_0 + \beta_1 \text{CI} + \beta_2 \text{POS} + \beta_3 \text{MS} + \beta_4 \text{BS} + B_5 \text{GFCF} + B_6 L + \varepsilon \quad (1)$$

Whereas:

$\boldsymbol{\beta_0}$= categorical

$\boldsymbol{\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6}$ model parameters

Dependent variable:

(GDP) represents economic growth.

Independent variables:

(CI)	Communications infrastructure.
(POS)	Point of sale operations.
(MS)	Number of mobile subscribers.
(BS)	Number of broadband subscribers.
(GFCF)	Gross fixed capital formation.
(L)	Total labor force.
$\boldsymbol{\varepsilon}$:	Random error.

3. Theoretical Framework

3.1 The Concept of the Digital Economy

The rapid spread of information technology and the use of electronic media led to a change in human lifestyles, which led to a change in the means of carrying out economic activities, followed by a new type of economy called the "digital economy," "internet age," or "information economy," which reflects a future vision of a world in which information is the fundamental element of the economy (Al-Sayed, 2020).

Many opinions have been expressed regarding a unified definition of the digital economy. Perhaps the most important of them are the following: Al-Khoury (2020, p. 175) describes the digital economy as "economic, social and cultural activities that depend on digital technologies to achieve the goals of sustainable development in its comprehensive and integrative sense.". As Al-Safi (2021, p. 27) puts it, it is "that part of the economy that specializes in everything related to information technologies and digital technologies."
It is defined as "an economy based on digital technologies." (Bukht & Heeks, 2018, p. 9).

3.2 The Importance of the Digital Economy

Digital transactions between businesses and consumers (B2C) have increased about three times daily in the last five years.[1] Therefore, the digital economy has become essential to the global economy (Siddiq, 2020). Hence, it has a significant role in building "smart societies" that enhance the capabilities of all parties within society and help governments improve the performance of their services provided to citizens, reduce inequality, and reduce and combat corruption through new technologies (Abdel-Al-Hassan, 2022).

[1] An abbreviation for Business-to-Consumer describes the commercial interaction between individual consumers and companies to meet their needs, such as retail stores, e-commerce, financial services, and others.

It also contributed to creating diverse and increasing opportunities, especially in fields that use advanced technologies, improving performance, raising productivity, and reducing production costs (Fawzi, 2017).

According to a report (2019) by the McKinsey Global Institute (MGI), it indicated the ability of the digital economy to create 60 to 65 million new job opportunities by 2025.

Economic importance is also reflected in the increased growth of the national economy, which contributes to enhancing the competition of the global economy and thus opens up commercial opportunities for international markets, reaching market sectors that were difficult to achieve; this leads to an increase in revenues, which increases the economy and the standard of living (Karim, 2022).

Abdel Jalil (2020, p. 8) pointed out that the importance of the digital economy stems from the following:

- It is an excellent tool for accessing global markets simultaneously at the lowest costs.
- It is an effective means of concluding deals between customers through direct electronic communication.
- It is a tool for exchanging interests between sellers and buyers and contributes to improving decision-making through timely information flow.
- It is a tool for project operations and organizations to achieve goals by eliminating delays.

3.3 The Impact of the Digital Economy on Economic Growth

Today's digital economy represents the most significant potential for the traditional economy, as it opens new horizons for the concept of added value through the distinctive tools and technologies of the Fourth Industrial Revolution, which represent a new addition to traditional economic resources. It has become more closely linked with the conventional economy, making it difficult to separate them. The digital economy has become the main driver of global economies. The rapid advancement of digital technology drives it as new economic concepts have emerged that affect, without exception, all sectors. The digital economy is also one of the world's fastest and most growing economies. It sometimes achieves five times the traditional economic growth rates, and this indicates that within ten years, the rate of the digital economy will reach about 50% of the total global economy (Al-Khoury, 2020).

Therefore, Saudi Arabia considers the development of the digital economy one of the most critical factors in enhancing the capabilities of the non-oil and promising sectors in achieving Vision (2030) and developing and diversifying the economy. (Digital Transformation Unit, MCIT, 2021). The Kingdom aims to push the digital economy forward by strengthening various sectors and achieving qualitative leaps. It also seeks to enhance the ICT sector as an essential means to achieve ambitious goals (MCIT, 2021), and it is also one of the sectors that are most rapidly developing and growing to keep pace with global changes (CST Annual Report, 2021).

Based on the importance of the digital economy in economic growth, Saudi Arabia gave this matter special attention and support until it was classified as the best country in digital performance among the G20 countries in the Digital Competitiveness Report (2021). Following that Vision, Saudi Arabia made significant progress in measuring digital transformation in 2022; It reached more than 80%, compared to 69% in 2021. (Digital Government Authority, 2023) Accordingly, the digital economy substantially boosted the GDP from 2017 to 2020. The digital economy's contribution to GDP was 11.6% in 2017 but increased to 14.5% in 2020, generating an estimated value of around SR 73 billion created for the Saudi economy.[2]

3.3.1 Real GDP

Since oil is the backbone of the economy in Saudi Arabia, the national economy still depends on oil revenues, and fluctuations in output and growth continue due to price changes. Despite this, the non-oil sector has shown clear

[2] Digitalization as a driver of economic resilience in Saudi Arabia during COVID-19 (2021).

and logical developments due to the efforts made in economic diversification and the transition to knowledge-based production, in addition to strengthening small and medium enterprises and the private sector. Since 2016, Saudi Arabia has sought to carry out economic reforms within the framework of the 2030 Strategic Vision, aiming to build a productive base for the Saudi economy and diversify sources of income to reduce dependence on oil revenues (Hariri, 2020).

Table 1 shows the increase in GDP in the past decades during the study period (2001-2022). The value of the GDP rose nearly double to reach SR 2.97 billion by the end of the year 2022, compared to SR 1.40 billion in 2001. By analyzing the GDP development over the period chosen in the study, a positive trend was found for the data from 2001 to 2022. This prosperity and progress faced a slight drop, such as in 2002. The value of the GDP dropped from SR 1.40 billion in 2001 to SR1.37 billion in 2002, then it grew in 2003, which is the highest rate of increase achieved during the study period, at a rate of 11.24%, benefiting from the improvement in oil prices in the global market and from the continued improvement of the local investment environment to enhance the contribution of the private sector (SAMA, 2005). It rose again until it reached SR1.93 billion in 2008 at a rate of 6.25%, then declined slightly, reaching SR1.89 billion in 2009.

Then, it returned to growth in 2018, which achieved a rate of 2.76%, reaching about 2.73 billion, compared to a decrease of 0.07% in 2017; this is attributed to the increase in the output of the oil sector by 3.1%, as well as the domestic product of the non-oil sector achieving a growth of 1.2%. Most economic activities grew at varying rates for the year 2018. (SAMA, 2019). The contraction at a rate of 4.34% in the year 2020 compared to the year 2019 turned into an increase, with the highest growth rate of 8.7% for the year 2022, the fastest growth rate in 11 years due to the noticeable expansion of oil activities by 15.4% and the continued recovery of non-oil activities by about 5.4% (Annual Report on the Status of the Saudi Economy, 2022). Transportation, storage, and communications activities reached the highest growth rates in non-oil activities at 9.1 % (GASTAT, website).

Table 1: Real GDP data from 2001-2022 (M SR.)

Year	Real GDP	Annual growth rate%	Year	Real GDP	an average Annual growth%
2001	1404870	-1.21	2012	2317863	5.43
2002	1365264	-2.82	2013	2383930	2.85
2003	1518748	11.24	2014	2479946	4.03
2004	1639617	7.96	2015	2596259	4.69
2005	1731006	5.57	2016	2657611	2.36
2006	1779274	2.79	2017	2655758	-0.07
2007	1812139	1.85	2018	2729117	2.76
2008	1925394	6.25	2019	2751831	0.83
2009	1885745	-2.06	2020	2632363	-4.34
2010	1980777	5.04	2021	2746242	4.33
2011	2198539	10.99	2022	2984636	8.74

Source: SAMA Annual Reports (2001-2022)

It is clear from the above the diversity of policies adopted by Saudi Arabia to support the national economy, as it diversified sources of income and provided the necessary environment to achieve the economic growth witnessed by the gross domestic product. (GASTAT Website)

3.3.2 Communications Infrastructure (CI)

The government of Saudi Arabia, in cooperation with the private sector, has improved the CI, Which has led to remarkable progress in the field of communications (Center Research and Information, 2022) as the readiness of the CI is the main factor in achieving the transition to the digital economy and implementing Vision 2030 providing the Internet and broadband to all of society, which constitutes the fundamental determinant in the development strategy and Vision 2030 of Saudi Arabia (Al-Harbi, 2020). As shown in Figure 1, the value of CI increased from

SR29.40 million in 2001 to SR177.13 million in 2019, reaching its highest value. It began to decline in 2020. It achieved SR164.22 million compared to the previous year and then rose in the last two years, 2021-2022. It reached SR197.36 million in 2022.

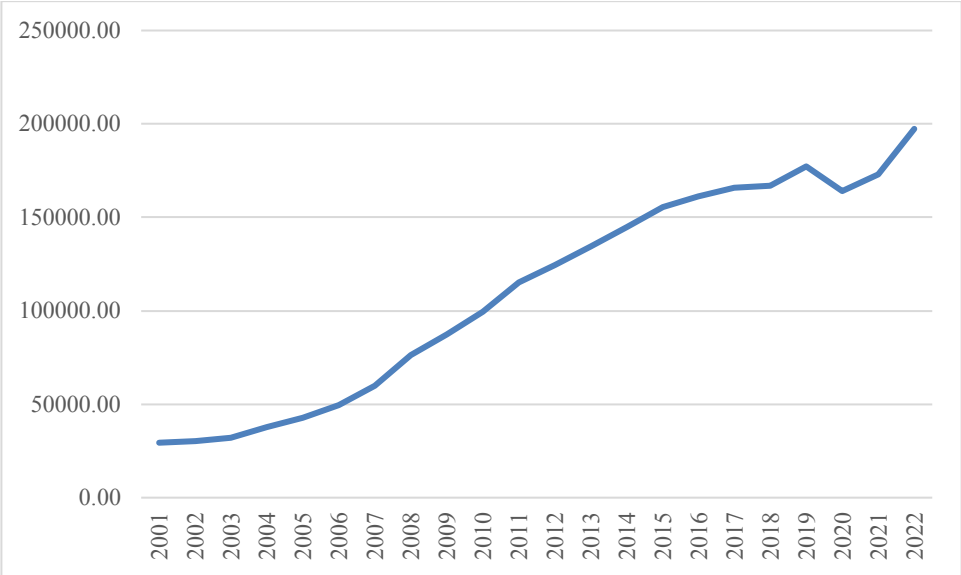

Figure 1: Communications Infrastructure (CI) in Saudi Arabia (2001-2022, M SR.)

Source: SAMA Annual Reports (2001-2022)

Regarding Internet service development, the Internet was introduced in Saudi Arabia in 1994. Educational, medical, and research institutions were granted permission to access the Internet, and then general users were able to access the Internet in 1999. In December 2000, the number of Internet users in Saudi Arabia was about 200 thousand, continuously increasing until it reached 27 million in 2018 (CST Website). Individuals' Internet use increased in 2022 to 94.3%, 1.4% over 2021 (Bulletin on Access and Use of Information and Communications Technology for Families and Individuals for 2022).

Because of enormous efforts to develop and expand CI, the Internet penetration rate has witnessed remarkable growth over the past years. This percentage increased from 93.3% in 2018 to about 98.6% in 2022, as shown in the following Figure 2:

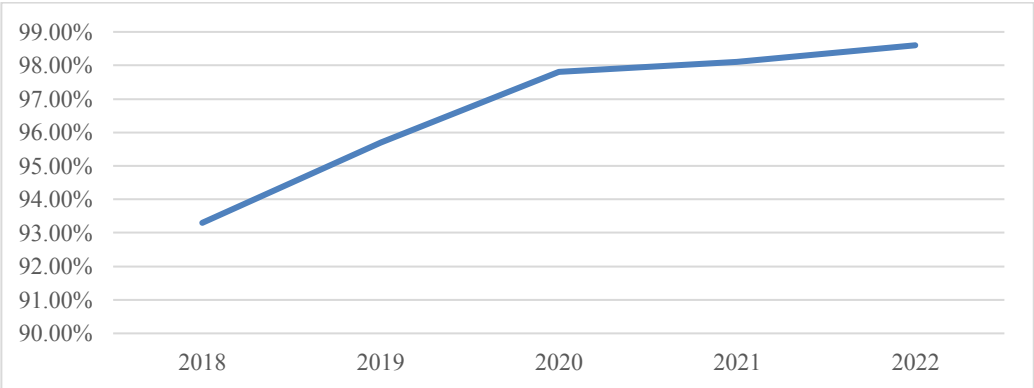

Figure 2: The Internet Penetration (IP) rate in Saudi Arabia during the period 2018-2022

Source: CST Annual Report 2021 and 2022

As Internet users increased, the need arose to improve data transfer capacity and speed to cover the number of new users (Al-Bishr & Nasr-al-Din, 2023). The average download speed for mobile Internet in Saudi Arabia in 2022 reached 180.21 MB per second, with an improvement rate estimated at 6.31%, compared to the same period of the previous year, 2021, while the average download speed for fixed Internet reached 107.80 MB per second in 2022, with an improvement rate estimated at 9.69%, compared to the same period in the year 2021, as shown Table 2:

Table 2: Average download speed for mobile and fixed Internet in Saudi Arabia

Period	Mobile Internet	Fixed Internet
2019	50.32 MB/s (Mbps)	50.03 MB/s (Mbps)
2020	97.54 MB/s (Mbps)	76.9 MB/s (Mbps)
2021	169.52 MB/s (Mbps)	104.19 MB/s (Mbps)
2022	180.20 MB/s (Mbps)	107.8 MB/s (Mbps)

Source: CST Annual Report for the years 2021 and 2022

3.3.3 Number of Mobile Subscribers

The mobile communications sector in the telecommunications market in Saudi Arabia is expected to grow significantly due to the spread of the Internet and smartphones; this aligns with the growing digital economy and Saudi Vision 2030 interest. In addition to the continuous efforts made by the CST and mobile network operators, 5G services are available, which has improved call quality and Internet speeds. As a result, the demand for mobile data and voice services has increased, and according to data issued by (GSMA Intelligence), mobile phone use is widespread, and there were more than 41 million mobile connections at the beginning of 2022. The COVID-19 pandemic has also stimulated growth in mobile data traffic due to increased online gaming, digital transactions, shopping, and downloading.

Additionally, the government has incentivized cashless transactions and helped develop the vast e-commerce market. These factors have positively impacted the growth of the mobile sector. (Mordor Intelligence Research, 2023)

As shown in Figure 3, during the period (2001-2015), the number of subscribers increased, reaching more than 52 million subscribers at the end of 2015, then it declined during the two years (2016-2017) to 40.2 million subscribers by the end of 2017; this is attributed to the fingerprint authentication campaign for subscribers to restrict the use of unregistered counterfeit cards that may threaten national security, which began in 2016 (Al-Jazira Capital, 2020), then 2018 witnessed the first increase in the number of subscribers since 2015 to exceed 41 million subscribers, and then the number began increasing in 2019 by about 43 million subscribers to 48 million subscribers in 2022, with an average growth rate of 3.96% over the past four years.

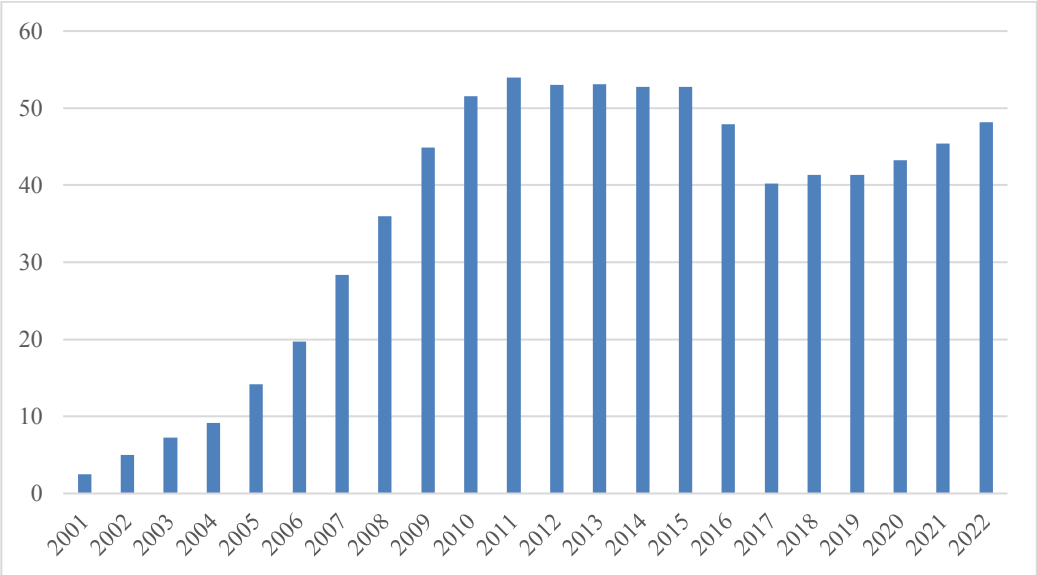

Figure 3: Mobile phone subscribers (MS) in Saudi Arabia (M)

Source: World Bank's World Development Indicators for the years 2001-2022

3.3.4 Number of Fixed Broadband Subscribers

Broadband networks have been recognized globally as essential infrastructure, clearly playing a prominent and increasing role in terms of promoting economic growth, changing growth engines, and improving competitiveness and continuity; the development of these networks has also become a significant measure of the state's strength in general (ITU, 2021). Through this, many countries became confident that the broadband Internet would effectively contribute to building a state and transitioning to a knowledge-based economy (Gelvanovska et al., 2014).

Studies show that Internet services will be the main factor for the growth of the ICT sector. They are also considered one of the most important sources of income for achieving the Ninth Development Plan; this includes striving towards a knowledge economy by applying electronic transactions and spreading their use in all regions of the Kingdom (Department of Economic and Market Studies (CITC, 2012).

Figure 4 shows the steady growth in the number of fixed broadband subscribers in the Kingdom during the study period (2001-2022), as the number of subscribers increased from 14 thousand in 2001 to 1.95 million subscribers by the end of 2011, with a penetration rate estimated at 33% at the residential level (CST, 2012). The number of subscribers increased further, reaching 6,33 million subscribers in 2015, in just four years, then a significant decline in the growth rate in the following five years until it reached 6,80 million in 2019. The number of subscribers increased during (2020-2022) from 7,89 million broadband subscribers in 2020 to 13,46 million during 2022.

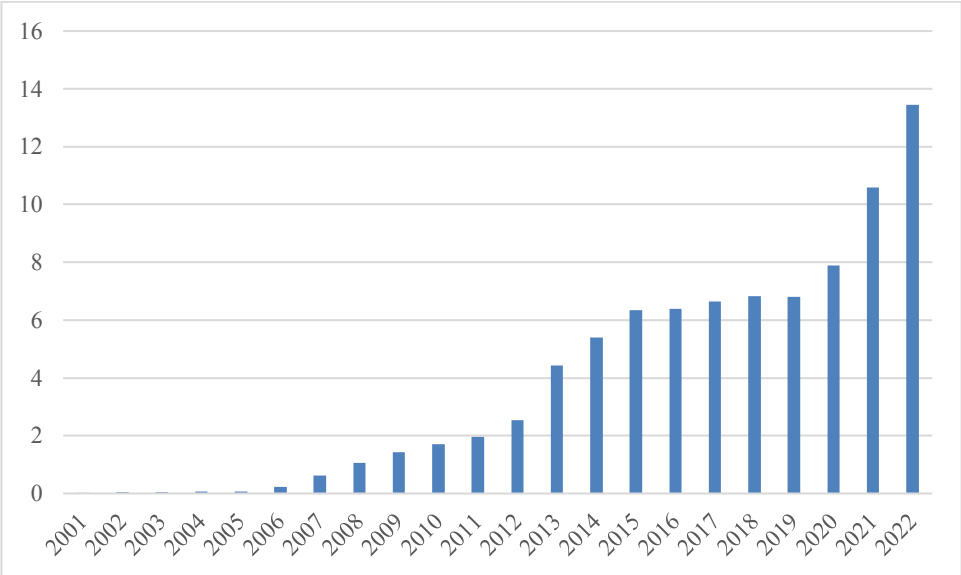

Figure 4: Fixed broadband subscribers (BS) in Saudi Arabia (M)

Source: ITU data for the years 2001-2022

3.3.5 Sale Points Operations

With the acceleration of technological development, the spread of the Internet, mobile devices, and electronic applications, and the inability of traditional financial solutions, the need for digital payments increased as many digital payment solutions and systems emerged (Al-Khoury, 2020).

The Kingdom's Vision 2030 aims to promote the transition to a society less reliant on cash, which is one of the main goals of the financial sector development program as part of Vision 2030, by providing multiple payment options for all individuals and companies to increase the share of digital payments in Saudi Arabia. To reach 70% of electronic payments by 2025, the development of electronic payment methods has motivated individuals to change their payments. Where they were previously accustomed to using cash to complete their transactions, they now rely on electronic means because they are more straightforward, safer, faster, and more efficient, leading to the share of electronic payments exceeding their monetary theory (SAMA, 2021).

Figure 5 clearly shows the growth in the number of sales. The number of transactions increased from 23.96 million in 2001 to 394.9 million in 2015. The technological development stage that began in 2016 showed that the growth rate increased by 32.83% compared to a rate of 20.76% in 2015. This growth is due to the launch of the "Mada Atheer" service, which witnessed great demand among Mada cardholders through NFC technology;[3] the possibility of making a payment process by simply passing the card in front of the point-of-sale operation; then the number of transactions began to increase by the end of the 2022 period by 40.4% to 7.26 billion transactions, compared to 5.17 billion transactions in 2021; this is attributed to the evident growth through several factors that contributed to this increase, the most important of which is the launch of many new payment methods, such as the "Mada PAY" service via "Mada Atheer" smart devices, as well as the near-field communication.

NFC technology allows the cardholder to perform operations through the service. Purchasing is possible by simply passing the card to the point-of-sale reader (SAMA, 2017). The COVID-19 pandemic has also helped push individuals to reduce reliance on cash, obliging all stores to provide point-of-sale devices (SAMA, 2021).

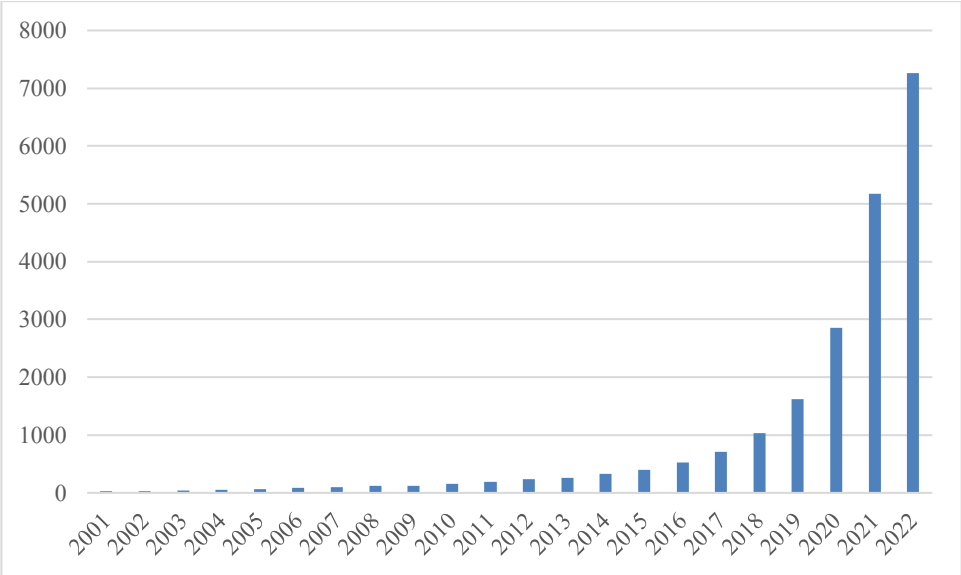

Figure 5: Point of sale operations (POS) in Saudi Arabia (M)

Source: SAMA for the years 2001-2022

4. Previous Studies

With the acceleration of the global trend towards digital transformation and its accompanying positive effects on all fields, the most important of which is the field of the economy, which has developed due to developments in the field of ICT, all of this has contributed to the interest of researchers in studying this transformation and its impact on economic growth (Bahrini & Qaffas, 2019, p2), as some studies have focused on the independent variables (CI, MS, BS, POS, GFCF, and L) also focused on studies revolving around the relationship of digital transformation and economic growth.

Donou-Adonsou et al. (2016) found that the Internet and mobile phones have contributed to economic growth. Increasing Internet and mobile phone use by one percentage point raises growth by 0.12% and 0.03 %, respectively. In addition, the study found that developing CI enhances economic growth in sub-Saharan Africa, with great scope to enhance the potential growth of telecommunications infrastructure.

Sepehrdoust and Ghorbanseresht (2018) studied the impact of ICT and financial development on developing economies in oil-exporting countries (OPEC) from 2002 to 2015, using the GMM-Panel model. The results showed that increasing the financial development and ICT variables by 1% increased economic growth by 4.8%.

[3] NFC is an abbreviation for Near Field Communication, a near-field communication technology similar to Bluetooth technology available for mobile devices.

The results also showed that labor force growth and total fixed capital formation growth positively impact countries' economic growth.

Majeed & Ayub (2018) analyzed the impact of ICT indicators at the local and global levels through the experimental study of ordinary least squares (OLS) techniques, and the generalized moments method (Gmm) helped determine that all information and communication technology indicators accelerate global and regional economic growth. However, some indicators, such as online service, CI, and e-government, are more suitable for promoting economic growth. On the other hand, the study results indicated that emerging and developing countries are acquiring a form of ICT more than developed countries, which confirms the argument that these economies are progressing through ICT. The study results also indicated that investment in ICT is necessary to achieve the goals of the knowledge-based economy in the twenty-first century.

Al-Hajj and Ben Jeddou's study (2019) used panel data to measure the impact of ICT infrastructure on economic growth in six Arab oil countries: Oman, Yemen, the United Arab Emirates, Saudi Arabia, Kuwait, and Algeria. After estimating the model using the generalized least squares method, they concluded that oil still mainly determines the economic growth of the six Arab countries because the impact of ICT in these countries has had a negative effect.

Haftu (2019) empirically analyzed the impact of mobile phones and the Internet on per capita income in sub-Saharan Africa from 2006 to 2015 using panel data from 40 countries and a powerful 2-step GMM method. The study found a growth in mobile phone penetration that has contributed significantly to the per capita GDP in the region after controlling for some other variables. It showed a 10% increase in mobile phone penetration, which resulted in a 1.2% change in GDP per capita.

Khandelwal and Agarwal (2020) examined the relationship between Internet broadband subscriptions and economic growth using World Bank data from 1998 to 2017 and a stochastic analysis model; this confirmed the study's findings, as broadband subscriptions positively impact economic growth.

Thoyibah & Sugiharti (2020) analyzed the impact of the percentage of individual Internet users, mobile cellular subscriptions (per 100 people), fixed broadband subscriptions (per 100 people), and employment on per capita of GDP in six ASEAN countries in the period 2011-2019, as the results of the study showed that the input of neoclassical growth theory is capital through telecommunications infrastructure consisting of the percentage of individual Internet users, and mobile cellular subscriptions (Per 100 people), fixed broadband subscriptions (per 100 people), telecommunications infrastructure based on indicators of the proportion of individual Internet users, and fixed broadband subscriptions (per 100 people), have a positive significance on economic growth. Surprising results on telecommunications infrastructure with indicators of mobile cellular subscriptions (per 100 people) significantly negatively impact economic growth. The labor force has no effect but is positive on economic growth.

Ibrahimi and Fetai (2022) examined the impact of ICT on the GDP growth in the Western Balkan countries from 2000 to 2019 by employing several tools. Various methods, such as pooled OLS, fixed effects, random Effects, and the Hausman-Taylor model with instrumental variables (IV), the study concluded that fixed-line telephone subscriptions and individuals' use of the Internet have a positive effect on GDP growth rates in contrast, broadband and mobile phone subscriptions have a negative impact on GDP growth.

Al-Hababi (2023) studied the relationship between the digital economy and economic growth from 2000 to 2020. The study relied on the autoregressive distributed lag (ARDL) model, and the results confirmed the digital economy's ability to enhance economic growth in Saudi Arabia. It also found that capital positively affects economic growth and has no significant effect on labor. The results are consistent with the endogenous growth model, assuming that technical progress drives economic growth.

5. Econometrics Analysis of the Study Variables

5.1 Introduction

This section aims to analyze the impact of the digital transformation variables under study, which are CI, number of POS, MS, BS, GFCF, and L as independent variables, and economic growth expressed as Real GDP as a dependent variable during the period (2001-2022), the data was analyzed by using the econometrics program E-views, by using the multiple linear regression method using the ordinary least squares (OLS) method, and several tests were conducted. Examining the quality of the model parameters used to explain the phenomenon under study is necessary.

5.2 Multiple Linear Regression Analysis

The model estimated the study period by adopting multiple linear regression using the OLS method, following the linear form of the function being estimated, and applying the necessary statistical tests for each to ensure that the estimated models are correct and free of measurement problems.

5.2.1 Results of Regression Analysis of the Linear Formula

The model was adopted by using the multiple linear regression method based on the linear formula by looking at equation (1) above, and the results appeared as in the estimated function (2):

GDP = 744545.500468 + 3.79158247814*CI - 1.27697862115e-05*POS - 0.0078383622691*MS - 0.00309465181283*BS + 1.48933244906*GFCF + 0.0514199 481064*L (2)

Table 3 shows the estimated model results through the coefficient of determination R^2 of 0.991, and the modified coefficient of determination R^2. Adj of 0.9887 explains the proportion of variation in the dependent variable (98.87%) predicted by the independent variables, while the remaining percentage (1.3) is due to the interpretation of random errors.

The high significant value of the "F" statistic, which reached 0.000, demonstrates the quality and suitability of the model for explaining the relationship between the independent and dependent variables.

The model estimation results showed that the probability values of the independent variables are statistically significant, except for the CI and the number of POS and BS.

It has been shown that the dependent variable, the GDP, has an inverse relationship with each of the following independent variables: the number of POS, MS, and BS. There is also a direct relationship between the GDP and the CI, GFCF, and L.

Table 3: Results of a linear regression model in linear form

Indep. Var.	Coefficient	t-stat.	p-value
C	7.45 E+11	3.834952	0.0016
CI	3.791582	1.503682	0.1534
POS	-12.76979	-0.566294	0.5796
MS	-7838.362	-3.201285	0.0059
BS	-3094.652	-0.124478	0.9026
GFCF	1489.332	4.161329	0.0008
L	51419.95	1.766177	0.0977

Some verification tests were used to verify that the constructed model was free of econometrics problems such as: Test the residuals to ensure no serial correlation and follow the normal distribution model. The value of Durbin - Watson (DW) was relied upon to test autocorrelation. The value of DW was 1.5037. Based on the tabular value,

it falls between (2.09 $d_u$and 0.77 d_l i) indicating that no decision can be reached because it falls between the two table values, making it inconclusive.

The Breusch-Godfray Lagrange multiplier (LM-Test) was tested, and the "chi-square" statistical value was 0.13, i.e., greater than 0.05, meaning there is no serial autocorrelation problem. Looking at Figure 6, the "Jarque-Bera" test for a normal distribution showed that it equals 0.176334, meaning it is greater than 5%. Therefore, the null hypothesis is accepted and follows a normal distribution.

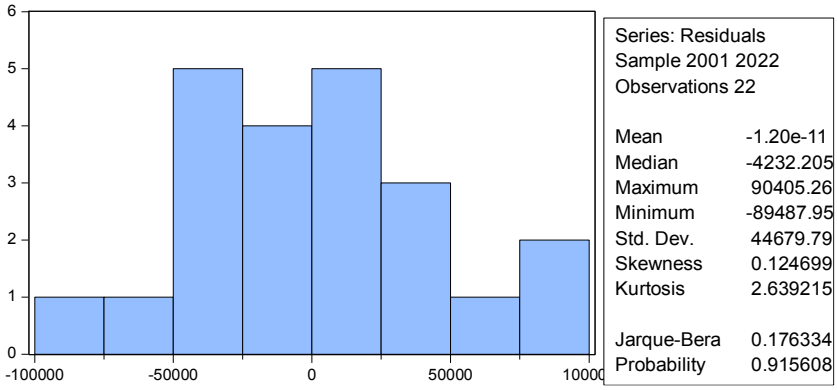

Figure 6: The natural probability of residuals

The correlation matrix must be verified to determine whether the problem of multicollinearity exists. Table 4 shows a high correlation between real GDP and CI.

Table 4: Correlation coefficients for linear function variables

	RGDP	**CI**	**POS**	**MS**	**BC**	**FGFC**	**L**
GDP	1.0000	0.9907	0.6128	0.7899	0.9199	0.9558	0.9810
CI	0.9907	1.0000	0.6078	0.8128	0.92089	0.9550	0.9860
POS	0.6128	0.6078	1.0000	0.2891	0.8389	0.5312	0.6567
MS	0.7899	0.8128	0.2891	1.0000	0.6010	0.9113	0.7699
BS	0.9199	0.9208	0.8389	0.6010	1.0000	0.8377	0.9295
GFCF	0.9558	0.9550	0.5312	0.9113	0.8377	1.0000	0.9240
L	0.9810	0.9860	0.6567	0.76993	0.9295	0.9240	1.0000

To improve the model result, some other independent variables, such as CI and the number of MS, were deleted to avoid the problem of linear correlation and enhance the results. Accordingly, a model was derived from model (1), thus obtaining the following model:

$$\text{RGDP}=\beta_0 + \beta_2\text{POS} + \beta_3\text{BS} + B_5\text{GFCF} + B_6 L + \varepsilon \quad (3)$$

Model (3) after deleting the variables CI and the number of MS:

GDP = 760964.345157 - 4.78799233196e-05*POS + 0.0522454273903*BS + 0.805867509364*GFCF + 0.0749649461714*L (4)

Table 5: Results of the linear regression model after deleting the two variables

Indep. Var.	**Coefficient**	**t-stat.**	**p-value**
C	760964.3	5.049689	0.0001
POS	-4.79 E-05	-2.600457	0.0187
BS	0.052245	2.972915	0.0085
GFCF	0.805868	3.929855	0.0011
L	0.074965	3.693447	0.0018

Table 5 shows that the general improvement in the model's performance is clear in terms of a high value of the coefficient of determination squared, which reached a value of 0.986, and the adjusted coefficient of the determination ($\boldsymbol{Adj.R^2}$) reached a value of 98.3%. The results of the overall significance of the model also indicate a high value of "F" of 305.13 with statistical significance = zero. As for the independent variables, the model estimation results showed that the probability value of the independent variables is statistically significant, and the sign appeared positive for the number of BS, GFCF, and L, and the economic theory agrees with this. Except for the independent variable, POS, the sign appeared negative, which contradicts the economic theory. Looking at the results of Table 6, it seems there is a problem of linear correlation between the variables, but there is no problem with multicollinearity.

Table 6: Variable correlation coefficients for a linear function

	GDP	**POS**	**MS**	**GFCF**	**L**
GDP	1.0000	0.6128	0.7899	0.9558	0.9810
POS	0.6128	1.0000	0.2891	0.5312	0.6567
BS	0.9199	0.8389	1.0000	0.8377	0.9295
GFCF	0.9558	0.5312	0.9113	1.0000	0.9240
L	0.9810	0.6567	0.7699	0.9240	1.0000

5.3 Estimating the Model Using the Co-integration Method

Integration is the association between two or more time series such that fluctuations in one cancel out fluctuations in the other, making the ratio between their values constant over time. Perhaps this means that time series data may be unstable if each is generated separately. Still, they are stable as a group, and, for example, this long-term relationship between a set of variables is useful in predicting the values of the dependent variable in terms of a set of independent variables and requires co-integration to occur if the two series are integrated of the first order separately. The model is estimated by following the following tests:

- Unit root test.
- Co-integration test.
- Test the error correction model.
- Causality test.

5.3.1 Unit Root Test

Several tests can be used to confirm the presence or absence of a unit root, that is, to determine the stability of the time series. The expanded Dickey-Fuller test (ADF) is among the most critical tests used in the unit root test. This test has three formulas:

1- The first formula (I) is without a fixed limit and has no time trend.
2- The second formula (II) includes a fixed term.
3- The third formula (III) comprises a fixed limit and a time trend.

The hypotheses to be tested are:

$H_0: P = 1$ The null hypothesis is that there is a unit root.

$H_1: P < 1$ The alternative says it does not contain the unit root.

They are as follows in Table 7:

Table 7: Expanded Dickey-Fuller unit root tests

	At the level			The differences are of the first order			Second-order differences		
variable	Conclusively	categorical and directional	without	Conclusively	categorical and directional	without	Conclusively	categorical and directional	without
GDP	0.8974	0.3955	0.9998	0.0094	0.0544	0.3395	0.0007	0.0058	0.0000
POS	1.0000	1.000	1.000	0.9996	0.0487	0.9996	0.0801	0.1047	0.0003
BS	0.9995	0.9020	0.9736	0.8469	0.1855	0.7150	0.0099	0.0306	0.0008
GFCF	0.7748	0.7447	0.9901	0.0432	0.1175	0.0301	0.0064	0.0373	0.0003
L	0.9717	0.4074	0.7636	0.0004	0.0032	0.6692	0.0006	0.0019	0.0000

The results showed that all-time series for all variables are not stationary at the 5% level of statistical significance, which indicates the instability and stationarity of the time series. However, after taking the first difference for the all-time series, the results show that most of the series have become stable at the first difference, except for the number of subscribers. Fixed broadband: Therefore, the second difference was taken for the all-time series, and therefore, the all-time series became stationary and stable at the first and second difference, and thus, they became integrated at the first difference and integrated at the second difference.

5.3.2 Co-integration Test

After conducting the unit root test (ADF), the time series of the model variables were integrated at the first and second degrees, and the "Johansson" method was used to test co-integration. The optimal lag period must be determined to conduct the Johansson co-integration test, determined by the vector autoregressive (VAR) model. The results of the comparison between the criteria become straightforward to decide on the most appropriate lag period for the model. The best optimal lag period is 2 log for the data of the variables and constructs. Therefore, the "Johansson" co-integration test was conducted, and it is clear from the results in Table 8 that it confirms the existence of three co-integration equations according to the impact tests and the maximum latent value test. Accordingly, the null hypothesis of no at least one co-integration equation was rejected at 5% significance, and the alternative hypothesis is accepted, which states that there is one co-integration equation, meaning there is at least one equilibrium relationship in the long run.

Table 8: Johansson co-integration test results

Number of vectors	Impact statistics	Critical value	Statistic Great values	Critical value
nothing*	129.3434	69.81889	63.72485	33.87687
1 at most*	65.61854	47.85613	30.07846	27.58434
2 at most*	35.54008	29.79707	21.69989	21.13162
3 at most	13.84018	15.49471	11.29754	14.26460
4 at most	2.542643	3.841466	2.542643	3.841466

5.3.3 Error Correction Form

The error VECM model is based on the assumption of a long-run equilibrium relationship. Since the stability of the series of estimation residuals has been proven and at least one co-integration equation exists, we can estimate the error correction model. Therefore, the study seeks to assess the long-run equilibrium equation and represent the error correction model. VECM ensures the possibility of evaluating the relationship between variables in the

long and short terms. The long-run equilibrium equation and the error correction equation are represented in the following two equations (5 and 6, respectively):

$$ECT_{t-1} = y_{t-1} - \beta_0 - \beta_{1xt-1} \quad (5)$$

$$\Delta y_t = ECT_{t-1} + \sum_{i=1}^{n} \beta_i \Delta y_{t-1} + \sum_{i=1}^{n} \delta_i \Delta x_{t-i} + \emptyset z_{t-1} + \mu_t \quad (6)$$

By estimating the error correction model, the results showed that the co-integration equation, which represents the long-run equilibrium equation, is as follows:

$$ECT_{t-1} = 1000GDP_{t-1} - 62.19338L_{t-1} + 467.6754GFCF_{t-1} + 0.673276POS_{t-1} - 0.955552BS_{t-1} + 25829873 \quad (7)$$

It is clear from the results that there is a statistically significant relationship for the long-term balance between the independent variables and the dependent variable, through which the error was corrected (17.27%), as the results of the Wald test showed. The absence of an equilibrium in the short run between the independent variables, which is equal to (0.0149), that is, accepting the null hypothesis that there is an equilibrium relationship in the short run and rejecting the alternative hypothesis that there is no equilibrium relationship in the short run, as the results of the LM test showed that there is no serial correlation problem; this is according to the listed results, which are equal to (0.4639), that is, rejecting the null hypothesis that there is a serial correlation problem and accepting the alternative hypothesis that there is no serial correlation problem, in addition to the stability of the model based on the CUSUM test as in Figure 7:

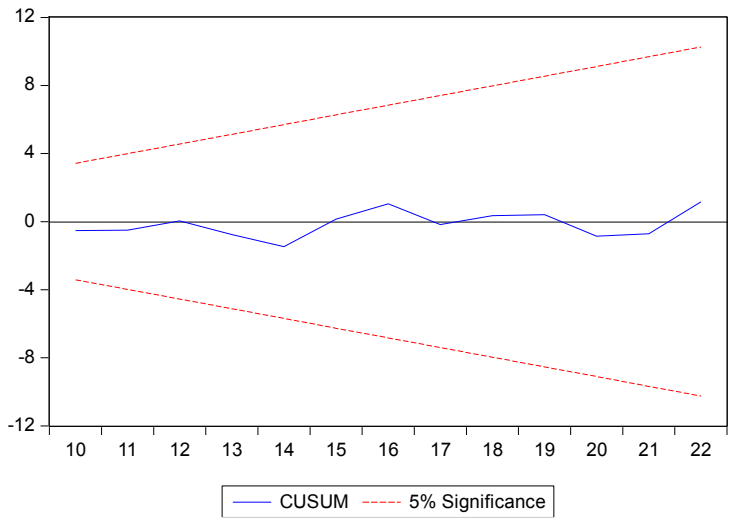

Figure 7: CUSUM structural stability test results

The error correction model parameters for the model are as follows:

$$\Delta GDP_t = -0.001727ECT_t - 0.051816GDP_{t-1} + 0.0022990POS_{t-1} + 0.055457BS_{t-1}0.877306GFCF_{t-1} - 0.190298L_{t-1} - 476710.5 \quad (8)$$

5.3.4 Causation Test

Granger causality is tested using Granger, which means there is a single causal relationship between the variables of the estimated model. Granger has interpreted a criterion for studying the correlation between two time series variables: To understand economic phenomena and distinguish between the dependent and independent phenomena that explain them (Shehi, 2011).

Table 9: Granger causality test

Variable	F statistic	Statistical significance
GDP does not cause POS	3.36025	0.0623
POS does not cause GDP	3.75699	0.0476
GDP does not cause BS	6.37388	0.0099
BS does not cause GDP	0.52397	0.6026
GDP does not cause GFCF	0.21636	0.8079
GFCF does not cause GDP	0.36608	0.6995
L does not cause GDP	8.77261	0.0030
GDP does not cause L	2.26071	0.1386

Given the F statistic value in Table 9, it is noted that there is a causal relationship between the dependent variable and the independent variables, which is a reciprocal relationship that extends from the number of point-of-sale operations (POS) to the gross domestic product (GDP) at a 10% significance level, and from the variable the number of subscribers Broadband (BS) and the total workforce (L) to the GDP variable, and this is achieved at a 5% level of significance. Regarding the causality of the independent variables, there is a unidirectional relationship that extends from the number of POS to the variable number of BS and GFCG at a 10% significance level. In addition to a reciprocal relationship between the L, the variable number of POS and GFCF are at a significance level of 10%.

6. Results and Recommendations

This research sought to measure the impact of digital transformation on economic growth in Saudi Arabia during the period (2001-2022). Through previous econometrics results, the following was concluded:

- A statistically significant inverse relationship (0.0187) exists between the number of point-of-sale operations (POS) and the real GDP. That is, whenever the number of point-of-sale operations (POS) increases by one unit, the real GDP decreases by about SR4.79 million.
- A direct, statistically significant relationship (0.0085) exists between the number of fixed broadband subscribers (BS) and the real GDP. That is, whenever the number of fixed broadband subscribers increases by one unit, the real GDP increases by about 0.0522 million riyals.
- A direct, statistically significant relationship (0.0011) exists between gross fixed capital formation (GFCF) and real GDP. Whenever gross fixed capital formation increases by one unit, the real GDP increases by about SR0.805 million.
- There is a direct, statistically significant relationship (0.0018) between the total labor force (L) and the real GDP, meaning that whenever the total labor force increases by one unit, the real GDP increases by about SR0.074 million.
- The results of the Dickey-Fuller unit root tests made it clear that the time series for all model variables are not stationary at the level, just as the all-time series were not stationary after taking the first difference. After taking the second difference, all model variables became stationary, indicating that they were integrated from the second degree, confirming the completion of the co-integration test.
- Two integration equations emerge based on the maximum latent value and the impact test through the Johansen co-integration test. Accordingly, it was revealed that there is a long-term equilibrium relationship between the independent variables and the dependent variable, which is the real GDP in Saudi Arabia; this indicates that digital economy indicators explain the long-term economic growth of Saudi Arabia.
- The error correction model confirmed the existence of an equilibrium relationship in the long run and the short run between the independent variables and the dependent variable, which is the real GDP, based on the Wald test. Based on the model, the rate of explaining imbalances and correcting errors in the short run was shown quickly (17.27%) during equilibrium in the long run.
- Granger causality test showed a reciprocal relationship between point-of-sale operations and GDP at a 10% significance level. In comparison, a unidirectional relationship extended from fixed broadband subscribers and the total labor force to the total GDP at a 5% significance level.

6.1 Recommendations

- Intensify endeavors to advance the CI by offering high-speed fixed and mobile Internet services and ensuring widespread availability at a reasonable cost throughout all urban and rural areas.
- Adhere to precise procedures for incorporating digital applications into all field operations.
- Foster awareness and promote a culture among persons regarding the imperative of recognizing and effectively utilizing ICT in diverse business sectors, particularly in light of its crucial role in addressing and surmounting emergencies such as the COVID-19 epidemic.
- Promote consciousness and incentivize consumers to make payments at retail locations to bolster economic growth.

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Creating A Sustainable Innovation with Stakeholder Engagement: A Case from Food &Agriculture Sector

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Abstract
The purpose of this paper is to focus on the contribution of stakeholder engagement to Sustainable innovation (SI) within the context of sustainable food and agriculture context. It investigates whether engagement with different stakeholders promotes sustainable innovation. The empirical analysis is based on a distinctive single case study of sustainable-oriented ventures that successfully deliver sustainable impact within their SI. A qualitative study, which an abductive approach was performed in order to delve the stakeholder engagement and its relationship with the type of SI. We use multiple data sources. Primary data such as semi-unstructured interview with several representative innovating ventures. Then, secondary data from multiple sources gathered to acquire deeper knowledge and information to capture the retrospective data about SI journey and development process of the ventures. Result showed that proactive role in venture to engage with various and wider stakeholders is needed to foster the SI particularly in system-building SI. Moreover, sustainability-oriented innovation (SI) as a journey and its characteristics constitutes from on practices that constitute day-to-day SI activities, strategies, activities, and linkages that resulting SI output and outcome. Particularly, stakeholders are part of these linkages. The wider and various of stakeholders also its engagement in co-creation of SI is affecting the output and outcomes of its SI. This research extends the response to the lack of systematic knowledge about stakeholder collaboration in SI. This paper provides a fine-grain qualitative analysis, a single case study, and identifies several types of stakeholders with various roles in the SI.

Keywords: Sustainability, Innovation, Stakeholder engagement, Start-up, Indonesia

1. Introduction

The acknowledgment of the importance of socio-ecological systems and human welfare has led to the emergence of sustainability as a comprehensive societal objective. This objective was initiated from the Brutland Report in 1987 (Brundtland et al., 1987), "*Our common future"* which almost more than three decades since the declaration yet still a small number of achievements of these objectives.

One of the sectors that potentially contribute to more sustainable development is agriculture and food sectors. The agriculture and food sector are intersection of numerous sustainability challenges and opportunities (Sehgal et al., 2024). In the context of sustainability challenge. The food sector encounters sustainability problems relating to environmental degradation, depletion of resources, food security and health concerns (Prasanna et al., 2024). From its production side only. a number of major environmental consequences have emerged, including greenhouse gas (GHG) emissions, water pollution, and biodiversity loss. On the other side, the opportunities related sustainability in the food sector are also a game changing to sustainable development. Sustainable innovation potentially occupies these opportunities to alleviate numerous sustainability challenges, environmental, social, and also economic challenges. Recent literature, highlight the potential food and agriculture value chain actors in promoting sustainability (Prasanna et al., 2024).

Deep and intense efforts are needed to accomplish the sustainable food and agriculture sector (SFA), and entrepreneurship is increasingly recognized as a means to further this objective (Parrish, 2010). Transition to more sustainability-oriented calls for major improvement, business-as-usual (minor adjustments) is not sufficient. The transition into sustainability usually forces the venture to pursue multiple goals (Zahra et al., 2009) In SI literature, small businesses, which relatively young, are initially more prone to participate in sustainable innovation rather than market incumbents (Hockerts & Wüstenhagen, 2010) as well as generally accepted view (Ács & Audretsch, 1990). New entrants are more likely to engage in sustainable innovation (SI) as they are less constrained by existing technological perspectives and are often led by idealists willing to try novel approaches without concern for market share (Hockerts & Wüstenhagen, 2010). Sustainability-driven ventures play a crucial role in achieving sustainable innovation, particularly in the SFA.

Innovation in sustainability involves complex, multi-dimensional challenges that require ongoing discussions among all stakeholders (Hall & Vredenburg, 2003) Addressing these challenges necessitates considering various stakeholder concerns (Jay Polonsky & Ottman, 1998) Research on stakeholder engagement often focuses on managing conflicts between companies and stakeholder groups, particularly within multi-stakeholder initiatives where stakeholders may not be central to a company's strategy (Goodman et al., 2017). However, there has been no systematic application of stakeholder theory in sustainability business cases and their link to sustainability (Schaltegger et al., 2019).

From the innovation lens theory, diverse stakeholder networks are essential for accessing tools and resources needed for innovation. These networks provide ventures with data, assets, and credibility, helping them respond to market demands (Elfring & Hulsink, 2003). This research emphasizes the importance of stakeholders in sustainable innovation (SI) by examining collaboration between small businesses and their stakeholders. It explores how these ventures effectively utilize stakeholders to drive and co-create environmentally and socially responsible products, services, and business models. This study extends the literature on stakeholder engagement, particularly in young and small businesses, which differs from the market incumbents traditionally focused on economic objectives (Hockerts & Wüstenhagen, 2010; Schaltegger et al., 2019).

We position small businesses as pivotal in early industry sustainability transformation, acting as initiators of high levels of SI that incumbents often overlook (Hockerts & Wüstenhagen, 2010). The food and agriculture sector, chosen for its intersection of sustainability challenges and opportunities, highlights the need for SI to address capital constraints and incumbent inertia. Sustainable food and agriculture can impact multiple SDGs simultaneously (FAO, 2018). This research focuses on a successful sustainability-driven venture in this sector, aiming to illuminate strategies and practices for engaging stakeholders in SI. It seeks to reveal how stakeholder engagement fosters innovation that balances economic viability with social and environmental responsibility. The research's significance extends to practical implications for businesses, policymakers, and other stakeholders. By understanding stakeholder engagement dynamics, businesses can leverage their stakeholders for positive change, and policymakers can design better frameworks and incentives for sustainable entrepreneurship.

Overall, this research aims to deepen understanding of stakeholder engagement as a driver of sustainable innovation, providing actionable insights and recommendations through a detailed case study that informs theory, practice, and policy in sustainable entrepreneurship.

2. Literature Review

2.1 Sustainability-oriented innovation: Definition and its categorization

The need for innovation that addresses economic, social, and environmental goals simultaneously is continuously increasing year by year. These comprehensive goals are initiated from Brutland Report (Brundtland et al., 1987). The first term of innovation that cover these objectives was eco-innovation which focused on creating positive environmental impacts (Schiederig et al., 2012). Then evolved to include social aspects, leading to terms like "sustainable innovation" and "sustainability-related innovation" (Klewitz & Hansen, 2014). Sustainable innovation (SI) integrates economic, social, and ecological management into innovation (Klewitz & Hansen, 2014).

In a business context, SI is defined as the commercialization of new or improved products, services, or systems that provide environmental and/or social value throughout their lifecycle (Adams et al., 2016; Hansen & Große-Dunker, 2013). SI can replace less sustainable solutions and transform organizational practices. SOI encompasses various types of innovation without normative restrictions, including product, process, marketing, and organizational innovation (Jarmai, 2022). Adams et al. (2016) categorize SI based on organizational strategy and innovation outcomes, offering a comprehensive view of achieving sustainability. They divide the SI into three categories. The following are: 1.) Operational optimization, (Low Sustainability): Focuses on improving production systems with new process-oriented knowledge and tools, aiming to reduce harm (mainly ecological) through internal technical innovations. 2.) Organizational optimization (Medium Sustainability): Aims to create broader societal benefits and transform organizational structures, processes, and culture. This involves internal and external stakeholder engagement, emphasizing social innovation. 3.) System Building (High Sustainability): Involves collaboration among multiple parties to achieve sustainable change within a broader ecosystem. This model emphasizes collective efforts for a net positive impact, focusing on organizational innovation.

In summary, the strategies and approaches for SI impact the type and output of innovations. These differences are illustrated in Table 1 and Figure 1, showing how varying SI strategies affect innovation outcomes.

Table 1: Three types of SI based on their approach and activities

	1 **Operational Optimization:** *doing more with less*	**2** **Organizational Transformation:** *doing good by doing new things*	**3** **Systems Building:** *doing good by doing new things with others*
Strategy	Comply with regulations or pursue efficiency gains	Embed sustainability as a cultural and strategic norm in a shaping logic that goes beyond greening	Logic of wide collaborations and investing in systems solutions to derive new, co-created value propositions
Process	Focus on internal and incremental innovation facilitated by use of tools	Adopt new values and platforms (e.g. reverse innovation) and new ideation practices (e.g. biomimicry)	Adopt new collaborative process platforms with diverse stakeholders
Learning	Exploit existing knowledge management capabilities to identify and access relevant knowledge	Engage with key stakeholders of the firm – internal and external	Develop ambidextrous skills enabling 'shadow tracking' and learning from experimentation with multiple new approaches
Linkages	Recruit external domain experts for new knowledge	Shift focus from intra-firm linkages to collaborations with immediate stakeholders	Get the whole system in the room to diagnose problems, understand system complexity, build trust and identify levers for change

Innovative organization	Exploit existing innovation capabilities	Embed SOI culture through the organization	Adopt new business paradigms (e.g. B-Corps)

Sources: Adams et al (2016).

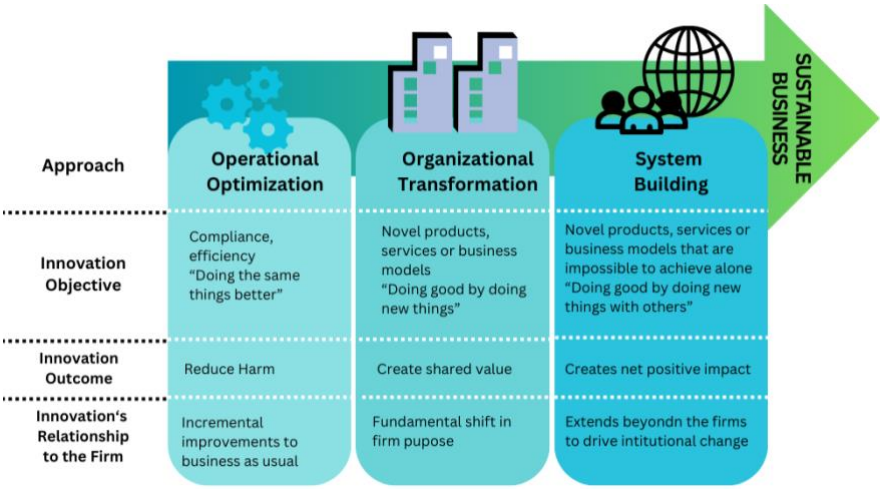

Figure 1: SI Level Categorization based on Organizational Approach

2.2 Small Ventures: Entrepreneurial Solutions for Sustainability

The modern economic system, with many uninternalized externalities, perpetuates unsustainable practices. These practices hinder sustainable development, highlighting the need for sustainability-oriented innovation (SOI) in businesses. Entrepreneurship, particularly sustainability-driven entrepreneurs, is increasingly recognized for advancing sustainable development by transforming unsustainable practices (Adams et al., 2016; Berchicci, 2005; Parrish, 2010).

Currently, the main barriers to sustainability are the operations of most businesses (Schaltegger et al., 2015; Weissbrod & Bocken, 2017). Large organizations face challenges such as organizational inertia and the economic benefits of unsustainable practices, which impede the implementation of SOI (Weissbrod & Bocken, 2017). SOI involves changes to an organization's philosophy, values, products, processes, or practices to create social and environmental value alongside economic returns (Adams et al., 2016). These changes are complex and require balancing economic growth with social equity and environmental protection, along with long-term resource investment and overcoming resistance to change (Adams et al., 2016).

In contrast, small, young, and new organizations are more flexible and prone to innovation, especially in SOI (Hockerts & Wüstenhagen, 2010; van Rijnsoever, 2022). These startups can propose radical solutions for sustainable development and emphasize adding social or environmental value without sacrificing commercial importance (Muñoz-Pascual et al., 2019). They are often led by idealists willing to try novel approaches, making them more likely to engage in SOI (Hockerts & Wüstenhagen, 2010).

However, sustainability-driven ventures face challenges balancing economic efficiency with sustainability goals (Zahra et al., 2009). They struggle to convert sustainability objectives into valuable product features due to a lack of understanding of sustainability-related problems and the complexity of solutions (York & Venkataraman, 2010). SOI often requires action without reliable performance data, particularly regarding social and environmental impacts (Berchicci, 2005). Additionally, these ventures need external links to access necessary tools, resources, data, assets, and market insights (Elfring & Hulsink, 2003; Maillat, 1990).

Therefore, pursuing sustainability objectives requires collaboration and engagement with diverse networks and stakeholders, especially for startups and small businesses. Despite their potential, more research is needed on how these ventures effectively engage stakeholders to create successful SOI.

2.3. The need for stakeholder engagement in SOI

Stakeholder theory shifts the focus from maximizing shareholder value to maximizing value for a broader range of stakeholders (Freeman & Reed, 1983; Freeman R.E., 1984). Freeman R.E., (1984) defines stakeholders as "any group or individual who can affect or is affected by the achievement of the organization's objectives," highlighting the interdependency between firms and stakeholders. Stakeholders include shareholders, employees, NGOs, and others.

Stakeholder engagement literature emphasizes categorizing and identifying stakeholders, often as primary and secondary (Ayuso et al., 2006; Buysse & Verbeke, 2003). Mitchell et al. (1997) classify stakeholders based on power, legitimacy, and urgency, influencing which stakeholders receive management attention. This suggests that managers' perceptions of stakeholders are adaptable and context-dependent (Rodriguez et al., 2002).

The concept of stakeholder engagement varies among authors. Greenwood (2007) views it as a process of positively involving stakeholders in business operations, while Sloan (2009) distinguishes between active and passive involvement, implying a broad stakeholder group including internal teams, consumers, suppliers, shareholders, NGOs, and governments. This variability makes stakeholder engagement a flexible and somewhat vague concept, depending on the extent and manner of engagement (DeFillippi & Roser, 2014; Ramaswamy, 2009).

Despite this variability, stakeholder engagement is crucial in sustainability-oriented innovation (SOI), which impacts social and environmental aspects and involves multiple stakeholders (Bos-Brouwers, 2010; Halme & Korpela, 2014). However, much stakeholder research focuses on resolving conflicts rather than positively integrating stakeholders into core operations (Clarkson, 1995; Eesley et al., 2023; Greenwood, 2007) Moreover, there is limited stakeholder theory research on business and innovation (Goodman et al., 2017; Schaltegger et al., 2019).

Innovation research shows the critical role of diverse stakeholders, especially in the early stages and commercialization of innovation (Aarikka-Stenroos & Lehtimäki, 2014; Berchicci, 2005). In SOI, engaging diverse stakeholders is particularly important for new entrants. Keskin et al. (2013) and (Aagaard et al. 2021) highlight stakeholders' roles in ideation, design, and market phases, emphasizing co-creation and value creation with stakeholders. Additionally, van Rijnsoever (2022) highlights the role of Entrepreneur Support Organizations in connecting sustainability-oriented ventures to financial networks.

This study extends the literature on stakeholder engagement in developing SOI, focusing on young and small businesses. These businesses have the potential to create radical, high-level sustainability-driven innovations. Recent studies have focused on incumbent firms, differing from startups and small businesses, especially in high-level sustainability approaches that emphasize wide collaboration to create value propositions (Adams et al., 2016).

3. Research Methodology

3.1. Research Method

To comprehensively understand stakeholder engagement in developing sustainability-oriented innovation (SOI), comprehensive evidence is needed (Goodman et al., 2017). This study employs a qualitative approach (Yin, 2009) to enable an in-depth examination of the cooperation between businesses and stakeholders (Denzin & Lincoln, 2000).

Our research uses qualitative methods to explore how stakeholder engagement contributes to SOI, allowing for detailed insights into stakeholder roles (Yin, 2009). As an exploratory study, we combine data collection and analysis methods for cross-validated findings (Langley, 1999).

Focusing on a single case study, we investigate a successful sustainability-oriented venture in the food and agriculture sector. This business integrates social, environmental, and economic innovations, reflecting a high level of SOI (Adams et al., 2016) and supporting sustainable food and agriculture (SFA) transitions. This distinctive case offers valuable insights into the development of SOI (Seawright & Gerring, 2008).

3.2. Data Collection

We created detailed case descriptions and triangulated answers using various qualitative data sources. This approach involved gathering multiple data types to capture the perspectives of both business actors and relevant stakeholders. Primary data was collected through semi structured interviews with open-ended questions posed to internal and external stakeholders. Secondary data included information about company activities from desk research, such as news articles, papers, press announcements, websites, and blogs. Over 100 documents were analyzed to acquire comprehensive information. The data sources are listed in Table 2

Table 2: Data sources

Source of data	**Number of data**
Interviews	2024: 3 Interviews with the innovator business
News article	>75 news article about Javara and Helianti Hilman (Founder) were retrieved from National, International News Agency (2013 - 2024)
Publications	>5 journal articles and a book on Helianti Hilman and Javara story >40 Javara article about activity of Javara in international and national event.

The interviews included key stakeholders, such as the founder, CEO, head of R&D, and head of marketing or business relations, who were knowledgeable about and actively involved in the SOI process. We also interviewed key stakeholders who participated in co-creating value propositions. Interviewees were chosen based on their contributions to the innovator firms. The retrospective interviews aimed to track the outcomes of innovation and activities.

By integrating diverse data sources and using rigorous analytical techniques, this research aims to provide a comprehensive understanding of the role of stakeholder engagement in driving sustainability-oriented innovation. This in-depth exploration seeks to uncover actionable insights and best practices to inform and inspire future sustainable development and innovation efforts, particularly those that involve various stakeholders in fostering SOI.

3.3. Data Analysis

The study focuses on sustainability-oriented innovation (SOI) as its analytical unit, using the framework proposed by Adams et al. (2016) to categorize types of SOI undertaken by ventures. This framework assesses the strategy adopted, the innovation process, linkages in development, and learning processes within the ventures. The framework is depicted in the table 3.

Table 3. SOI Indicator

SOI Indicator	**Detail explanation**
Strategy	Organizational and management processes aligned to deliver sustainability
Innovation process	The organization of the innovation process to deliver sustainability, from searching for new ideas to converting them into products and services and capturing value from them
Learning	Recognizing the value of new knowledge, assimilating and applying it to support sustainability
Linkages	internal and external linkages crafted as opportunities for learning and influencing around sustainability

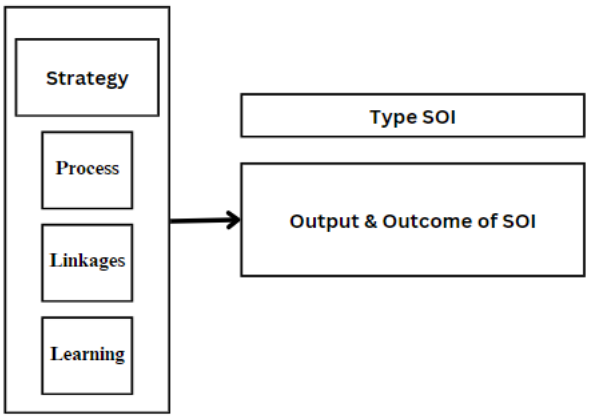

Figure 2: Research framing

We use Adams et al.'s (2016) framework as the foundation to analyze the types of sustainability-oriented innovation (SOI) throughout its journey within the venture, spanning initiation, development, dissemination, and continuous innovation phases. SOI is viewed as a dynamic process unfolding over time.

Our approach involves iterative data analysis, moving between theoretical insights and case-specific reports to uncover emerging patterns. Using Nvivo 10, we conduct coding, beginning with open coding techniques (Strauss & Corbin, 1998) for first-order analysis. Subsequently, we perform second-order analysis (Gioia et al., 2013) to identify broader categories and themes related to the SOI process, including the strategies adopted and the engagement of various stakeholders. Throughout the analysis, regular discussions between the authors ensure rigor and depth. Triangulation of findings from coding and desk research enhances validity and provides comprehensive insights into the SOI process and stakeholder engagements.

4. Results & Discussion

4.1. Indonesia's context of Sustainable Food and Agriculture

Indonesia's agricultural sector has played a pivotal role in poverty reduction and economic growth, contributing significantly to GDP (13% in 2019) and employing about one-third of the workforce (Wihardja et al., 2023). However, recent growth rates have been declining, from 3.89% in 2018 to 1.84% in 2021, posing challenges for further poverty alleviation and ensuring food security (Statistics Indonesia, 2022).

Despite these contributions, Indonesia faces persistent challenges in enhancing agricultural productivity and improving farmers' incomes to eradicate extreme poverty. Additionally, the agriculture sector is crucial for food and nutrition security, with Indonesia aiming to reduce stunting rates by 14% by 2024, although 21.6% of children under five were stunted in 2022 (Statistics Indonesia, 2022).

The sustainability of Indonesia's agriculture system is increasingly critical amid global climate change concerns. Agro-food systems are significant contributors to global greenhouse gas emissions, with Indonesia's emissions largely stemming from land-use change and deforestation, particularly for palm oil cultivation (Ritchie et al., 2022). Indonesia has recently accelerated its target to achieve net-zero carbon emissions by 2050, emphasizing the need for sustainable agriculture practices and increased efficiency across the food value chain.

To address these intertwined challenges of poverty eradication, food security, and climate action, innovative sustainable agro-food system solutions are essential. These solutions should prioritize minimizing deforestation and habitat conversion, while also promoting climate change adaptation and mitigation among farmers and consumers alike.

4.1.1 Brief company profile

Javara, founded in 2008 by Mrs. Helianti Hilman, exemplifies a social enterprise dedicated to preserving Indonesia's agricultural diversity, promoting sustainable practices, and uplifting local communities. At its core, Javara integrates cultural preservation, environmental conservation, and economic empowerment. They focus on supporting small-scale farmers, foragers, and indigenous communities across Indonesia, aiming to safeguard traditional farming techniques and biodiversity.

Through partnerships with over 50,000 farmers nationwide, Javara offers a wide range of products, including spices, grains, and agricultural commodities. These collaborations underscore their commitment to inclusivity and community engagement, providing farmers with market access and ensuring fair trade practices.

Javara's initiatives extend beyond economic benefits, contributing significantly to socio-economic development. By facilitating fair compensation and market opportunities, they empower local communities economically while fostering pride in cultural heritage. Their holistic approach to sustainability combines environmental stewardship, cultural preservation, and socio-economic development, creating lasting impact across Indonesia's agricultural sector.

Javara's success story is remarkable, expanding their products to 55 countries on 5 continents. They supply goods to 43 retail companies across 522 outlets and serve 107 hotels, restaurants, and catering services in Indonesia. With a product portfolio exceeding 981 Stock-keeping units (SKU), including rice, grains, cooking oil, and superfoods, Javara demonstrates how traditional farming practices can thrive in global markets.

This case of Javara serves as a model for developing sustainability-oriented innovation (SOI) without relying on disruptive technology. Instead, Javara emphasizes appropriate innovation and business development that involves diverse stakeholders, such as traditional farmers and indigenous communities, through fair trade and market access initiatives. Recognized with national and international awards, Javara exemplifies how sustainability-focused businesses can succeed while minimizing environmental impact and maximizing stakeholder collaboration ((Javara, 2024); Schwab Foundation, n.d.).

4.2. SOI Journey

4.2.1. SOI Initiation

The founder of Javara was inspired to support traditional farmers and indigenous communities due to three key factors. Firstly, a close familial connection played a significant role. This personal tie encouraged the founder to develop a deeper appreciation for local farmers and motivated efforts to address their challenges, such as unfair trade practices and marginalization by export companies. Secondly, the founder's professional background and work relationships provided opportunities to engage with traditional networks. This exposure further fueled the founder's commitment to solving issues faced by farmers, leveraging their expertise and networks to support agricultural communities. Thirdly, personal interest in the value of traditional farmer products also shaped the founder's perspective. Recognizing the potential of these products in premium retail stores and other markets sparked a drive to promote and elevate traditional farming practices to a global audience.

The reason behind the idea of Javara was initiated based on the problem that traditional farmer faced (e.g, unfair trade).
“So, from the problems that I see, whether it's about the problem of farmers being repressed by importers, I want to try to help them, on the other hand these products can go to European markets and so on ¬” - Founder

The founder initiates to help them by creating access to the market. This idea was influenced from combination of the support family, personal interest, and also professional experience that related to helping the traditional farmer and know the opportunity to their product in the premium store around the world. See Table 4.1 for further detail. Based on the initiation of the idea outlined by the founder, Javara started creating SOI with a sustainability-driven goal. Helping the traditional farmers she met by marketing and developing his agricultural products for premium retail and international markets.

4.2.2. SOI Development

Javara, founded in 2008 and operational since 2009, has a mission centered on empowering traditional farmers by creating natural and organic food products in partnership with them. This approach has led to several innovations at Javara. Initially, traditional farmers faced challenges selling their products through middlemen at unfair prices due to their dependency. Javara's collaboration introduced fair pricing and direct selling, empowering these farmers and expanding collaborations with similar communities such as indigenous groups and foragers.

Traditionally, these farmers used basic tools and methods, producing goods with organic practices but lacked market access and fair pricing. Recognizing the value in these traditional production methods, Javara positioned them as unique selling points, emphasizing organic certification and sustainability values. This strategic shift enabled Javara to compete in the organic market segment, commanding higher prices that benefited the farmers.

With a strong sustainability focus from the outset, Javara continued expanding its network to include diverse communities like indigenous groups and local foragers as suppliers and partners. These communities contributed valuable knowledge on diverse foods, inspiring Javara to co-create a variety of products. Javara provided guidance to these communities, assisting with organic certification, technical support, and capital investments to enhance productivity.

4.2.3. SOI Dissemination

During its initial commercialization phase, Javara targeted the premium market segment by collaborating with regional premium supermarkets like Ranch Market. This strategic move allowed Javara to access affluent consumers who preferred organic products sold in premium stores. Despite early successes, from 2009 to 2011, Javara faced sales stagnation in Jakarta due to limited local appreciation for domestic organic products, with imported alternatives being preferred.

To overcome this challenge, Javara shifted its focus towards the international market. They actively sought guidance and participated in the Swiss Import Promotion Programme (SIPPO) to enhance their products according to international standards. This initiative facilitated Javara's entry into the European market, followed by engagements with trade partners globally, including Canada, the United Kingdom, and Costa Rica. Consequently, 80% of Javara's total sales stemmed from exports, highlighting their success in international markets.

The positive reception abroad also boosted Javara's reputation domestically. Recognition from Indonesian media, government bodies, business magazines, and NGOs further solidified Javara's credibility among local consumers. This newfound legitimacy increased the acceptance and purchasing power of Indonesian consumers towards local organic products, marking a pivotal moment for Javara's growth and sustainability efforts.

4.2.4. Continuous innovation of SOI

After expanding into international markets, Javara experienced increased demand for its products, necessitating adjustments to meet diverse regional specifications. Javara Academy, an internal department dedicated to supplier relations, facilitated this adaptation by co-creating innovations with traditional farmers, indigenous communities, and local foragers. They provided working capital and technical assistance, similar to their initial strategy, while leveraging market insights from ITPCs to tailor products more precisely to international markets. As Javara grew, this department evolved into "Seniman Pangan," a spin-off entity that expanded supplier networks and fostered an ecosystem for unique product development, such as the award-winning plant-based salt from Papua.

Javara also engaged with luxury hotels to promote food heritage and preservation. Collaborative activities included dining experiences and events like workshops and market days, highlighting Indonesia's rich food biodiversity and ancient culinary traditions. Supported by government organizations such as the Ministry of Education, Culture, Research and Ministry of Tourism and Creative Economy, these initiatives received high-profile endorsements

from ministers and ambassadors, positioning Javara as a leader in cultural gastronomy and sustainable food systems.

Furthermore, Javara's collaboration with the Indonesian Embassy in Qatar exemplified gastro diplomacy, integrating diplomacy with gastronomy to foster international relations and innovation. This initiative not only introduced new products and services but also underscored the role of food in diplomacy and cultural exchange.

With increasing awareness of sustainability, Javara engaged with sustainability-focused forums and venture capital, like Terratai, through the Indonesian Business Investment Forum on Nature-Based Innovation. This collaboration resulted in additional investments to expand Javara's farmer network and enhance its environmental stewardship efforts in critical Indonesian ecosystems.

Finally, Javara initiated a multi-stakeholder cooperative platform to create an inclusive and sustainable ecosystem for Indonesian heritage food production. This platform united diverse stakeholders to collaborate on building a resilient business model that prioritizes health, sustainability, and prosperity for all involved.

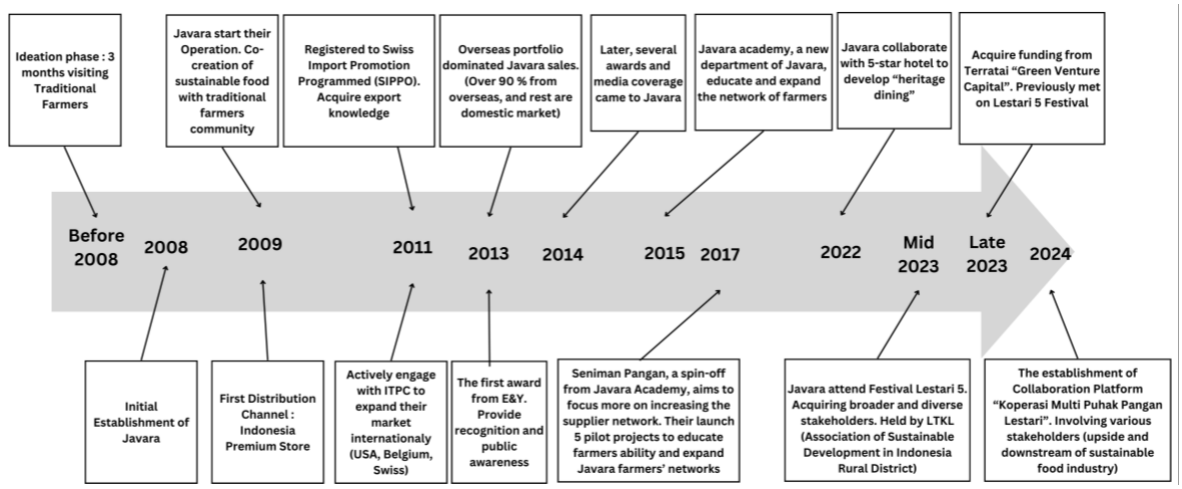

Figure 3: Timeline of important event in Javara SOI Journey

4.2.5. Engagement during SOI Journey

From Javara's SOI Journey (initiation, development, dissemination, continuous innovation phase) we highlighted several stakeholders that had been engaged by the venture to successfully the SOI. These stakeholders consist of 6 groups: Suppliers, internal team, market relation, promoter, government, and financial support organizations.

Start from Javara suppliers, traditional farmers network who had been engaged by Javara in initiation, development, and continuous innovation phase. During Javara's initial establishment (2004-2008), traditional farmers played a crucial role. The founder, through excursions to various regions, gained knowledge about diverse agricultural products and heritage farming practices linked to organic farming. This knowledge strengthened the founder's idea. Later, these communities became suppliers and co-creation partners in Javara's development. In the development phase. Javara and these stakeholders co-created product innovations, with farmers becoming primary suppliers. To create competitive products that meet customer needs, Javara required: 1) good quality, 2) high quantity, and 3) various certifications (e.g., organic). To achieve these, Javara provided interventions such as technical assistance, working capital, and tool investments. This support enabled farmers to maintain sustainable practices while meeting market specifications. As a result, previously non-competitive traditional farmers could now compete nationally and internationally. This co-creation elevated both Javara and the farmers, allowing Javara to meet market demands and farmers to receive fair compensation while preserving their traditional agricultural practices. After Javara tapped into the international market and met its requirements, product demand increased significantly. Products with embedded sustainability values became highly valued internationally due to rising awareness of social and environmental sustainability. Javara is now expanding its network of traditional farmers

who share their vision of sustainability, such as organic and regenerative farming. This expansion aims to create a broader and more diverse network of traditional farmers.

Second, the internal team has Javara pivotal roles in development and continuous innovation phase. The internal team played significant roles in co-developing the founder's idea and translating it into market-ready products. The R&D department co-created with and assisted suppliers, including traditional farmers and indigenous communities, to meet market requirements. Additionally, Javara Academy, which later became the sister company Seniman Pangan, focused on supplier engagement and network expansion, resulting in a diverse range of products. Guided by their sustainability-driven vision and mission, Javara emphasized creating solutions with stakeholders. Activities included technical assistance, stakeholder engagement (especially with traditional farmers and indigenous communities), improving product quality and quantity, and providing working capital investments. The collaboration between stakeholders and the internal team successfully established sustainable production practices, such as minimizing waste, using non-toxic materials, practicing regenerative farming, and ensuring fair labor practices. In the continuous innovation (after the venture established and commercially success), Javara Academy, known as Seniman Pangan Academy before., is responsible for engaging with the traditional farmers' network, expanding and educating a new member of the networks. This initiative aligns with the increased demand from the international market. Expanding the traditional farmer networks has led to various product innovation ideas. Together, they co-created several innovative products, earning multiple awards for their innovations.

Third. The market relation has a pivotal role in dissemination and continuous innovation phase. During Javara's initial commercialization (dissemination), national premium retail stores served as their primary distribution channel. One premium retail store offered Javara shelf space, allowing them to gain market experience and response. This store also suggested benchmarking Javara's products against imported organic products. This partnership helped Javara access the upper middle-class market, which typically shops at premium stores. From 2009 to 2011, Javara faced stagnation in sales. Despite efforts with premium retail partners in Jakarta, Bogor, Bekasi, and Tangerang, the market response was poor. Indonesian consumers preferred imported organic products over local ones. Consequently, Javara's founder decided to expand into the international market. Javara joined the Swiss Import Promotion Programme (SIPPO), receiving technical assistance and market opportunities, including expo participation in Switzerland. Javara then engaged with International Trade Promotion Centers (ITPCs) from various regions, gaining market information to expand into international premium stores and Michelin-starred restaurants. For instance, ITPC Chile helped Javara enter Chile's supermarket market, where their vegetable noodles became a best-seller. Feedback from ITPCs ensured product-market fit and contributed to Javara's increased market presence and brand recognition. The increasing awareness of sustainability practices in recent society has led luxury hotels to create new service experiences focused on sustainability. These hotels collaborate with partners like Javara to jointly create a unique dining experience that integrates heritage culture and food. The luxury hotel’s view Javara as a prominent actor and knowledge provider in terms of food culture and biodiversity.

Fourth, promoters which have a pivotal role in dissemination phase. Increase public awareness and market recognition of Javara. This moment went after successfully expanding to international markets, Javara attracted significant attention from media agencies and organizations. They were featured in both national and international publications, including Kompas and CNN Asia, and received awards from various entities such as the government, business magazines, and NGOs. This recognition boosted Javara's credibility and influence, enhancing local Indonesian consumers' trust in their organic products. These stakeholders actively promote Javara, raising market awareness, especially in Indonesia. As a result, news agencies and award-giving bodies proactively engage with Javara due to their success in bringing traditional farmer commodities to international markets.

Fifth, the government. Government stakeholders play diverse roles in Javara's market expansion. The Indonesia ITPC Department from the Ministry of Trade acts as intermediaries with the international market, similar to ITPC offices worldwide that collaborate with Javara. Their contribution was crucial during Javara's international market expansion. Additionally, they act as legitimators. For instance, the Indonesian Ministry of Education and Culture, the Ministry of Tourism, and Dharmawangsa Hotel collaborated with Javara on the Borobudur Temple cultural heritage event. Here, Javara's CEO and representatives spoke about the diversity and heritage of forgotten Indonesian foods, enhancing Javara's reputation beyond merely selling products. Also, in continuous innovation

phase. Government stakeholders play various legitimizing roles for Javara. They support collaborative events, such as the one between Javara and a luxury hotel, attended by the Ministers of Education and Culture, and Tourism and Creative Industries, to increase awareness of these activities. Another key player is the Indonesian Embassy in Qatar, which organized a gastro diplomacy event featuring Javara. This event included an interactive session, showcasing diplomacy through gastronomy. Additionally, LKTL (Lingkar Temu Kabupaten Lestari) hosts an annual sustainability event that brings together stakeholders, including district government authorities and sustainability-driven ventures. This network not only offers a diverse array of stakeholders but also serves as a collaborative partner in sustainable food and agriculture supply chains. Moreover, the Ministry of Foreign Affairs engaged diplomats with Javara's store in Kemang, providing a foundation in cultural values and food-based diplomacy (gastro diplomacy). This further solidifies Javara's standing with the government, emphasizing cultural heritage alongside their products.

Last, the financial support organizations. At the LKTL annual sustainability event, Javara and Terratai (Green cappital venture) met unintentionally and discovered a shared vision of sustainability. This common ground led to a close partnership, with Terratai becoming a financial provider for Javara. Their collaboration focuses on expanding networks of traditional coconut farmers to enhance sustainability. As part of their agreement, Javara is required to partner with 1,000 coconut farmers. Terratai also plays a significant role in other collaborative efforts. They act as a financial provider for various collaborative platform ecosystems, supporting the broader sustainability initiatives that align with their vision.

In summary, we depict the stakeholder's engagement during Javara's SOI journey in table 4.

Table 4: Stakeholder engagement during SOI Journey

No.	Stakeholder Group	SOI Phase				How the stakeholders engaged
		Initiation	Development	Dissemination	Continuous Innovation	
1	**Suppliers** Traditional farmers Indigenous community Local foragers	✓	✓	-	✓	Proactively engaged by Javara.
2	**Internal Team** R&D Department Sister company (Seniman pangan)		✓	✓	✓	Proactively engaged by Javara
3	**Market Relation (National & International)** Premium store. ITPC, 5-star hotel (National) ITPC (International)			✓	✓	Most of stakeholder are proactively engaged by Javara. Only case Swiss premium store representative is first contacted by Javara
4	**Promoter** National & International Magazines & Noble Awarder			✓	-	Most of stakeholder are reactively engaged by Javara.

No.	Stakeholder Group	SOI Phase				How the stakeholders engaged
		Initiation	Development	Dissemination	Continuous Innovation	
5	**Government Organization** Ministry of Education, Ministry of Tourism, Embassy of Indonesian for Qatar; LTKL			✓	✓	3 of stakeholder are proactively engaged. Only, embassy of Indonesia for Qatar is reactively engaged by Javara.
6	**Financial Support Organization** Green venture capital (Terratai)				✓	Proactively engaged with Terratai.

4.3. SOI Types

Based on the journey of SOI innovation from Javara. We summary the several points related to the criteria of SOI from Adams et al. (2016) below. We category Javara SOI from their innovation journey as "System Builder". It is highlighted in Javara initial motivation of sustainability to encourage traditional farmer with fair trade, maintain value of biodiversity and regenerative farming practices, and promote healthy diet and nutritious food to the society. This encourages them to take actively created shared innovation with their stakeholder (both ideatian, and development process). They identify key stakeholders such as traditional farmer as a primary supplier, Then, the connection and engagement in market relation (both regional and international relation) which provide Javara market information and access to expand their market internationally. Overtime, Javara proactively engage the wider and various stakeholders to shape the ecosystem of traditional indigenous farmer product. Various stakeholders such as government organization, venture capital, and extended network of Javara supplier. This resulting enormous sustainability output, (e.g., over 50.000 traditional farmers are joining the partnership with Javara) and outcome (e.g., biodiversity preservation with regenerative farming, leverage life of traditional farmer with fair trade). To foster of shaping the ecosystem of these business model, Javara encourage more collaboratively approach with their stakeholders. They create co-creation platform "Koperasi Multi Pihak Pangan Lestari", a cooperative platform to create wider collaboration and co-creation innovation in sustainable food industry. The stakeholder is comprised from upstream and downstream actor in the industry (see Figure 4.6). This approach is highly related to "System Building" with locates ventures / firms in an industrial ecosystem characterized by mutually affecting interactions between multiple stakeholders embed in networks, community, collaboration and partnership (Adams et al. 2016). The development of SOI practices in Javara (from its initial establishment to recent time are detailed in Table 5.

4.4. Discussion

4.4.1. Small ventures and its potential to pursue SOI

Javara's journey into sustainable innovation (SOI) was profoundly influenced by various factors that shaped its founder's motivations and the initial idea initiation. These influences were instrumental in addressing societal and ecological challenges, particularly focusing on marginalized communities like traditional farmers and indigenous groups. The founder's close connections, personal background, and professional experiences all played crucial roles in sparking the idea for Javara, aligning with literature on sustainability-oriented entrepreneurship (Shane et al., 2003).

From its inception, Javara aimed to tackle societal and environmental issues in Indonesia, viewing these challenges not just as problems but as opportunities for meaningful impact (Googins & Escudero, 2014). Their approach diverged from conventional profit-oriented models, instead prioritizing sustainability-driven initiatives aimed at fostering social equity and ecological resilience (Muñoz-Pascual et al., 2019).

As a small, agile venture unbound by corporate constraints, Javara leveraged its founder's values to pioneer a systemic approach to sustainable food production (Hockerts & Wüstenhagen, 2010). This involved implementing criteria outlined by Adams et al. (2016), focusing on strategy, process, learning activities, and linkages to build a network-centric ecosystem. Over time, Javara expanded its stakeholder network and intensified collaborations, challenging the prevailing unsustainable practices within the food supply chain.

Their efforts culminated in establishing a collaborative platform, "Koperasi Multi Pihak Pangan Lestari," which invited stakeholders from across the food supply chain to foster sustainability-oriented practices. This platform not only amplified their impact but also positioned Javara as a game-changer in addressing systemic sustainability challenges (Hockerts & Wüstenhagen, 2010; Adams et al., 2016; Szekely & Strebel, 2013).

In summary, Javara's evolution from idea initiation to impactful SOI underscores the power of small, values-driven ventures in driving meaningful change within the sustainable food and agriculture sectors, challenging traditional "Business-as-usual" practices for a more sustainable future.

4.3.2. Stakeholder engagement, and utilize to development of SOI

In many cases of stakeholder engagement, ventures like Javara take proactive steps to initiate and nurture relationships with stakeholders throughout the process of sustainable-oriented innovation (SOI). This proactive approach aligns with principles from innovation and stakeholder theory (Freeman et al., 2004; Ramaswamy, 2009), emphasizing the importance of stakeholders as sources of knowledge, market insights, legitimacy, promotion, and financial support (Adams et al., 2016; Leavy, 2014; Aksoy et al., 2022; DeFillippi & Roser, 2014; Sloan, 2009).

Javara, driven by sustainability goals to address societal challenges through SOI, actively engages a diverse array of stakeholders. These stakeholders play pivotal roles across ideation, development, dissemination, and continuous innovation phases. The venture strategically chooses which stakeholders to prioritize based on their ability to contribute to building a sustainable food and agriculture (SFA) ecosystem. This ecosystem approach leverages the interconnected relationships among stakeholders to enhance Javara's efforts in achieving milestones and sustaining impact (Amir & Prabawani, 2023).

By proactively engaging stakeholders, Javara not only gathers essential knowledge and market insights but also secures support for legitimizing their initiatives, promoting their innovations, and accessing financial resources. This collaborative approach not only strengthens Javara's sustainability efforts but also fosters a broader impact within the food production sector, promoting resilience and equity among traditional farmers and indigenous communities while advancing ecological sustainability.

5. Conclusion

This research addresses a gap in systematic knowledge about stakeholder collaboration in Sustainability-Oriented Innovation (SOI), particularly within the agriculture and food sector. Building on qualitative analysis through a single case study, the study identifies various stakeholder types and their roles in SOI. This approach contributes empirical evidence to the field, complementing theoretical frameworks like those by Adams et al. (2016), which emphasize the role of startups and small businesses in systemic change and sustainability-oriented development as System Builders.

For managers, particularly those in emerging ventures or those transitioning towards sustainability-oriented practices, this research provides practical insights into stakeholder engagement capabilities. Understanding how

to effectively engage stakeholders in pursuing sustainability goals is crucial. Freeman (2004) highlights that managers play a pivotal role in shaping organizational identity, relationships with stakeholders, and strategic decisions regarding sustainability initiatives. By leveraging stakeholder relationships effectively, managers can enhance their organization's ability to drive sustainable development and systemic change.

Despite its contributions, this study also identifies several limitations that suggest avenues for future research. Firstly, the focus on a single case study limits generalizability. Future studies could explore multiple cases within the same industry or across different sectors to compare stakeholder dynamics and organizational responses to sustainability challenges. Secondly, examining competitors within the same ecosystem and their strategies could provide further insights into competitive positioning and ecosystem dynamics. Lastly, exploring how ecosystem contexts and the phase of ecosystem development influence organizational strategies and sustainability outcomes would enrich our understanding of sustainability-oriented innovation.

By addressing these areas, future research can deepen insights into how organizations in various industries navigate stakeholder collaborations and ecosystem dynamics to foster sustainable development effectively. This would contribute significantly to both academic literature and managerial practices aiming to achieve sustainability goals through innovation and stakeholder engagement.

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Can Co-operatives Collaborate with Each Other? Cooperative Business Networks: Consumer Cooperatives' Willingness to Partner with Producer Cooperatives (Case Study in Employee Co-Operatives at Depok City, West Java, Indonesia)

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Abstract
One of the significant challenges facing cooperative businesses is leveraging networks and connections efficiently. Cooperative Business Networks (CBN) like the Indonesian Jaringan Usaha Koperasi (JUK) aim to integrate buyers and sellers, reduce distribution costs, and strengthen market channels for SMEs. However, JUK has not been fully optimized, with cooperation primarily occurring between secondary forms of cooperatives rather than at a broader network level. This study explores how consumer cooperatives can better serve their members by partnering with producer cooperatives within the cooperative supply chain. It investigates the factors driving these partnerships and the success of cooperative networks. The qualitative methodology used includes case studies and in-depth interviews with key personnel from cooperatives in Depok City, West Java, Indonesia. Findings suggest that successful collaboration in the supply chain requires producer cooperatives to meet specific quality and administrative standards. The research has both theoretical and practical implications, offering insights into improving cooperative relationships and suggesting the need for further quantitative studies to generalize findings across different cultural contexts in Indonesia.

Keywords: Cooperative Business Networks, Consumer Cooperatives, Producer Cooperatives, Supply Chain Collaboration

1. Introduction

One of the biggest challenges in the cooperative business was the inability to efficiently capitalize on the network and connections between co-operatives (Co-op). It states in (Pesämaa et al., 2013) that Local co-operatives networks are autonomous volunteers, which makes a member cannot offer the network functions independently. Local cooperatives have to survive independently, and cooperative management must prioritize survival above growth. The sluggish growth of the cooperative comparison to other organizations demonstrates this.

Cooperatives, whether small or large, require their own network to run their businesses. One of the big Co-op, Novacoop, said that the network (heavy "bond" of mutualistic purposes) was the secret of the success of Co-op. (Frau, 2010 in Arcidiacono, 2018). Novacoop is one of the big Co-op in Italy that was founded in 1973 with total sales in 2021 is € 1.099 billion. They are a Consumer co-operative that has employees of 4.684 people. REWE Group, headquartered in Germany, is another major cooperative. The REWE Group is a German retail and tourism cooperative headquartered in Cologne. The cooperative trade association is based on a network of individual merchants. Sales lines include Billa, Penny, and Rewe, among others. In fiscal year 2022, the REWE Group's total external sales were €84.4 billion. The REWE Group is Germany's second-largest supermarket chain, after EDEKA.

The crucial role of networks in cooperative organizations can also be seen as a fundamental purpose for the growth of cooperative organizations. According to (Mestres & Lien, 2017), the Community Support Association (CSA), goal of co-operative organizations is to create a community-based organization that supports small-scale local organic agriculture, while also resisting the dominance of huge agrifood chains by changing the relationships between producers and consumers.

Special bonds in Co-op can make networking in the supply chain even more promising. Even though networking is only one of many options for cooperatives, it is a common manner of doing business due to its solidarity nature. (Menzani & Zamagni, 2010) Co-operatives Business Network/ Jaringan Usaha Koperasi (CBN/JUK) established by Indonesian Cooperatives Council has the intention to integrate buyers and sellers across Indonesia, reduce distribution costs, open market information, and strengthen the market channel for SMEs products. (Setiawan et al., 2019).

In Indonesia's cooperative environment, JUK institution under the Dekopin Organization has not performed optimally. This is evidenced by the lack of cooperation in cooperative relationships. The JUK institution has not been properly utilized in accordance with the program's goals and expectations. The majority of cooperative cooperation occurs between secondary forms of cooperatives such as central cooperatives, combined cooperatives, and main cooperatives. This collaboration, however, has a different meaning than the establishment of JUK.

This study aims to address the following question:

1. How do consumer cooperatives serve its members who participate in cooperative businesses?
2. What factors drive consumer cooperatives to partner with producer cooperatives in the establishment of cooperative networks within the co-operative supply chain?

This study is organized as follows. Section two contains a literature assessment on the cooperative point of view and the importance of networks. Section three presents an overview of the technique. The fourth section focuses on the data results. Section 5 includes a discussion, conclusions, and practical consequences.

2. Literature Review

2.1 Relationship between Cooperative

Cooperatives had been envisioned by Mohammad Hatta, the founding father of Indonesia, as a business model compatible with the Indonesian people's behavior to gain prosperity. Article 33 of the 1945 Constitution of Indonesia states that the economy shall be organized as a collaboration enterprise based on the family as the fundamental. Cooperatives share the same ideological values about democracy, equality, and solidarity, and not merely for profit-making. Cooperatives, as defined by the International Cooperative Alliance, are self-governing organizations formed by individuals who come together voluntarily to fulfill their economic, social, and cultural requirements and ambitions through a collectively-owned and democratically-managed business. The cooperative is presented as an optimal solution for individuals to focus on their areas of expertise and become owners of their own enterprises. This allows them to overcome challenges such as limited administrative knowledge, adherence to market regulations, and enables them to have stronger bargaining power with suppliers and customers. (Ribas et al., 2022).

Cooperatives and social capital have an unbreakable relationship, whereas cooperation or connection is the purpose of achieving organizational success. The cooperative business model was motivated by a set of principles and values, one of them is cooperation among cooperatives. (ICA, 2018) For organizations to function successfully and efficiently together, social capital is the attach that allows for collaboration in the first place (Ghauri et al., 2023). Social capital is a complicated and unresolved concept that covers a variety of disciplines. It is also frequently seen as a resource associated with social relationships and networks. (Mazzarol et al., 2012) Organizations for Economic Cooperation and Development (OECD, 2001, p.1) describe social capital as "networks together with shared norms, values, and understandings that facilitate cooperation within and among groups."

A network must be created in the interaction between consumer and producer cooperatives since they have distinct goals but may assist each other accomplish them. In this sort of connection, cooperatives require networking rather than forming alliances. It is strengthened by definition of alliance and network by (Spekman et al., 2000), an alliance is a collaborative relationship between two or more organizations with the purpose of pursuing mutually compatible goals that would be impossible for each to accomplish alone. In the other hand, network is a set of interactions that connect separate. External relationships include alliances and networks, which involves business relationships between organizations.

Networks frequently display patterns of "cooperation," which indicate a distinct equilibrium between cooperation and competition. The relationships between intra-networks and internetworks are based on collaboration and antagonism. The network comprises a collection of actors or nodes linked by specific types of ties, such as friendship. These interactions are interconnected to collectively work towards a common objective, creating a pathway that indirectly links players who are not directly connected or bonded. The network's bonding patterns give rise to distinct structures, and individuals assume positions within these structures. The application of the notion of ecosystems to entrepreneurship extends beyond the creation of inter-entrepreneurial network structures. This concept encompasses the ability of a region to foster the emergence and establishment of players and infrastructural arrangements that facilitate the growth and advancement of innovative business enterprises. (Muhyi, Purbasari, et al, 2020).

Indonesian cooperatives have a cooperative movement organization, which then forms a special institution, the Cooperative Business Network, to handle the development of cooperative cooperation (JUK). JUK provides facilitation, mediation, and assistance programs to cooperatives that want to do business together or cooperatives that want to market their products, including both consumer and producer cooperatives. To carry out this program, JUK creates a database and organizes business meetings and workshops using the Erfa method, which has been shown to be effective in other countries' cooperative movements, such as Denmark. JUK operates on a network level, whether it is local, national, or regional.

2.2 Supply Chain Relationships within the Co-op

The term "supply chain between co-ops" refers to the interaction between co-op producers who offer goods and consumer co-ops who assist in marketing the co-op producer's products. The connection between co-ops cannot be defined just by producer co-ops; it also requires market demand, which is met by consumer co-operatives. A supply chain itself is a network of organizations that participate in a set of in both directions connections involving various processes and activities represented for creating value in the form of products and services. Effective supply networks must have a shared objective among all members, as well as a desire for players to be flexible in order to improve the overall performance of the supply chain. A supply chain must take into account market demand rather than solely supply volume, which is often the duty of the supply chain's focal the organization (for example, the co-op) (Mazzarol et al., 2012).

According to the Theory of Networks, a firm's position in the network determines its strategic activities and network dynamics. Firms use strategic activities to affect their position in the network. The cooperative's role in the food chain is crucial as supply networks become more optimized, leading to horizontal integration and stronger

partnerships with retail chains. By doing so, primary producers will be closer to the final customer. (Valerie A. Kelly, Eric W. Crawford, 2003).

The researcher presents the SOTA (State of the Art) table in Table 1 below to show the novelty of this research.

Table 1: SOTA Table

Author	Result	Document Type	Methodology	Originality and Weakness
(Setiawan et al., 2019)	Goodwill-based trust, Competence-based trust, Reward power, Cooperation, and Formal contract have a positive impact on **Willingness to collaborate**, except Coercive Power	Journal	SLR, Quali	**Originality**: provides the conceptual framework that focuses on the factors that initiate the relationship between supplier and Cooperative **Limitation**: this conceptual framework should be tested empirically in the future to confirm this framework.
(Pramudhita et al., 2015)	Cooperatives should create an inclusive business ecosystem that allows them to collaborate with all stakeholders to improve their operations' effectiveness, efficiency, and professionalism. An inclusive business ecosystem platform allows stakeholders to be involved in business, and everyone participating can connect and provide value to one another.	Conference	Quali	**Originality**: provides the proposed business literacy program and proposed the framework of the inclusive business ecosystem for the Cooperative Online platform
(Klingenberg et al., 2022)	There are two significant impacts: Value creation is increasingly emerging through platforms overseen by influential individuals beyond industry borders. Farmers' ability to benefit from value capture relies on the competitive dynamics among these players, as well as norms and regulations.	Journal	Quali	**Originality**: Offers an analysis of the four components of the agricultural value chain, facilitating an expanded understanding of its digital evolution. **Limitation:** focuses mainly on what is happening in significant corporations and should evaluate the influence of digital transformation on agricultural small and medium-sized businesses.
(Cherbib et al., 2021)	• High collaboration motivates partners to invest in digital platforms, leading to joint learning. • Various digital solutions, such as platforms and digital infrastructure, facilitate the sharing of resources and the collaborative creation of value.	Journal	Quali	**Originality**: a key initial stage of academic activities, carrying precise and practical consequences. **Limitation**: The concerns stem from the particular methodologies and geographical/industrial conditions of the study. More precisely, the qualitative element of the study offers comprehensive and intricate data, but its effectiveness is limited due to the small sample size.
(Ghauri et al., 2023)	• Networking can be more effective in terms of developing long-term relationships while simultaneously acting as collective owners of the cooperative. Besides from commercial interests, cooperatives may facilitate networking events to allow SME members to engage with one another, so strengthening the power of the relations formed via networking. In this way, social capital is built.	Journal	Quali	**Limitation:** The co-operatives and SME members chosen were based in Australia, therefore further investigation across nations, cultural situations, and co-operatives is required. The co-operatives chose the SME members who were interviewed in order to save time during the recruiting process. While there may have been certain biases in selection, the SME members were honest, critical, and informed about the topics addressed.
(Al-Hakim & Lu, 2017)	• Trust is an indicator of effective collaboration, but it does not have a direct impact on company performance. However, the research reveals that cooperation acts as a full	Journal	Quanti	**Originality:** Sample size and response rate was inspired to conduct a study that spans a wide variety of sectors in various regions, taking into account reliance and share market as additional factors influencing company success in addition to collaboration and technology dissemination.

	mediator between trust and company performance. The empirical results from this study suggested that technology diffusion does not accurately transform into cooperation, and that organizations do not pay enough consideration to process performance when collaborating with partners.	It is desirable to expand such research to include the influence of mediation and moderation of predictors on the outcome concept. **Limitation:** Only considers one type of industry (SEP makers) and focuses on one place (the city of Wenzhou). Other restrictions to consider include cultural differences, the function of government, and infrastructure. The created study model has limitations since it does not account for elements that may influence both cooperation and company success, such as interdependence, share market, and power. The number of measurements for each construct was limited due to pilot interviews.

3. Methodology

The qualitative methodology was using case studies. Case studies are a research approach in which the researcher examines deeply a program, event, activity, process, or one or more persons. Cases are specified by time and activity, and researchers collect comprehensive data across time utilizing a range of data-collecting collecting methodologies (Stake,1995 in Creswell, 1991).

The method was using an in-depth interview with CBN/JUK key personnel from Co-operatives in Depok City, West Java Indonesia. Depok was one of the cities that has many cooperatives rather than in other region. The purpose of this study is to gather consumer cooperative perspectives in order to establish collaboration amongst cooperatives. The selected co-operatives include employee cooperatives with stores are provided in Table 1. Three types of cooperatives that own businesses other than convenience stores, loans, and savings, have set out to compare how cooperatives work, what similarities exist between them, and how they wish to interact with producer cooperatives.

The data was collected around July-August 2022. A qualitative methodology will be used to learn more about the possibility of cooperative to collaborate with each other. The depth of data will be discovered and may be formed to be more precise to the JUK institution's needs using qualitative techniques. The data will be conduct using primary data to know about the relationship of the willingness of the members of cooperatives to create value co-creation with each other. The qualitative analysis will be used NVIVO application to validate the result of the in-depth interview, so the credibility is higher than the result with it.

The result of a previous study by (Setiawan et al., 2019) shows that the relationship between suppliers and cooperatives in Indonesia can be built if they have the Willingness to Collaborate with Goodwill-based trust, Reward power, Cooperation, Formal Contract, and Competence-based trust, although the study was limited by the conceptual framework. The result of the journals will base the theoretical foundation and the interview with practitioners to validate and support these chosen factors.

The result of that paper will support this study to know that the conceptual framework similar to the empirical study. This study used qualitative methodology to understand the willingness of Co-operatives to collaborate with each other. The tools that will be used in this research are an in-depth interview with 3 key persons of the Co-operatives CBN/JUK institution.

The researcher chose a semi-structured interview because it allows for follow-up questions and investigation of new areas that occur during the interview, as well as specific data that give deeper insights. The flexibility to explore, the ease with which data may be analyzed, and the ability to collect subtle insights and contextual details were all advantages of this interview type. The way of conducting interviews will also be designed to prevent bothering people. Before conducting the interview, the researcher will obtain permission from both the interviewee

and the Indonesian Cooperative Council, which serves as both an institution and a member of the institutions. The research findings will be utilized not just by the university, but also by Indonesian cooperatives.

Table 2: Selected cooperatives

Cooperative	Background	Interviewee status
Koperasi Teratai Mandiri (KTM)	KTM has around 770 members and generated IDR 21 billion in revenue during the 2020 fiscal year. KTM generates its income from many sectors, including convenience stores, savings and loans, laundries, and equipment rentals. KTM offers three retail outlets available for both members and the general public.	Executives' leader
Primer Koperasi Vira Gupti (PKVG)	PKVG boasts a membership of around 810 individuals and has reported a revenue of IDR 5 billion in the fiscal year of 2021. PKVG generates its income from the convenience store, savings and loan, gas station, and water refill sectors. PKVG has two stores available for both members and the general public.	Executives' treasure
Koperasi Karya Sejahtera Indonesia (KKSI)	KKSI has a membership of around 445 individuals and has reported a revenue of IDR 2 billion in the fiscal year of 2021. KKSI generates its income via operating in the convenience store, savings and loan, and canteen management sectors. KSSI operates a single retail location that serves both its members and the general public.	Executives' leader

Table 3: Construct and Measurement

Construct	Measurement	Type of Questions
Cooperative Organization	. What is your cooperative's name? . How many people are currently members of your cooperative? . What are your cooperative's total assets? . Are there any rules requiring members to shop at your cooperative store? If so, what are the specifics of these rules? . How much money did members spend last year? . What percentage of members always shop at the cooperative store? and how long will it be?	**Semi-structed Interview**
Member Management	How is the store's service currently? What would you like to see improved in the co-op store's service? How do you meet members' needs and desires? What mechanism is used to determine member needs?	
Inventory Management	How does your cooperative's supply-chain management work? Are there any requirements for receiving and selling supplies to members? Where do the goods for your cooperative shop come from? What types of suppliers make your cooperative's life difficult? What's the problem? How much of the product remains unsold? What was the inventory turnover ratio last year? What will happen if the merchandise does not sell?	
Sales Management	What do you want to develop in the store to increase sales but haven't been able to accomplish?	

	What is the source of these difficulties? What commodities do your members frequently look for when they shop at cooperative stores? What is the method of procuring merchandise used by members? (cash/credit) and how is the system performing? What happens if a member fails to pay? What kind of punishment will be meted out?
Collaboration in supply chain	What do you think if a producer cooperative wants to collaborate with your cooperative? What kind of compensation will you accept if you want to collaborate? What will you do if the product's quality falls short of expectations? What do you hope the collaboration will achieve?

4. Results

4.1. Cooperative Organization

All employee cooperatives have no explicit regulations concerning members' responsibilities to purchase items from the cooperative's store. All of them used the same concept, which was to award bonus points to members who shopped at the business. The point might affect the member's share of profit sharing or SHU, which is awarded at the end of the year. Nevertheless, KTM employs a slightly different strategy to urge their members to purchase. They discussed the regulations in the end-of-year meeting, also known as the RAT, and established an agreement to oblige members to buy in the store with a minimum purchase of IDR 5 million every year. However, if they do not meet the minimum purchase requirement, the member SHU will not be fully allocated to that member, and that amount will be placed in a reserve fund.

The level of member engagement in purchasing at cooperative stores varies considerably. According to KSSI, around 25% of its members make purchases at the cooperative. While in PKVG, it has reached 50% of members who make purchases in the store. KTM, which employs a different technique, now has 75% of its members making purchases of at least 5 million rupiah.

4.2. Member Management

All cooperatives agree that they want to meet the needs of all their members. A way that cooperatives fulfill the needs of their members is to collaborate with third parties, such as motorcycle/car dealers, banks for home loans, and other companies that may give discounts if managed by the cooperative. The expectations for improvement in cooperative management were different; KSSI hopes for retail services to be digitally and automatically connected into the system, hence reducing human error in store management. Other cooperatives that were more systematized were more willing to accommodate all of their members' needs. However, the strategy of all cooperatives examines Members' needs are found via a number of methods including word of mouth, member meetings, and WA groups.

4.3. Sales Management

Employee Co-operative tends to organize their organization with some variables, that summarize in five points that were stated here.

First, member of Co-operatives was allowed to buy with cash or credit systems. The credit system has more requirements, and there are some boundaries that have to be fulfilled by the members.

Interviewee 1: “(…) The members have to fill the form and stated their origin in office and home, the treasury will be the one who gives the permit based on their wage.”

Interviewee 3: "(…) The members have to fill the credit sales book in the store, give the description of themselves and sign. (…)"

Second, for improvement planning, most of them are traditional Co-op, they give the online service using WhatsApp groups and some of them try to look for a strategic place that has most people mobility.

Third, the obstacle to implementing the improvement planning was that members like to buy offline with coming directly to the stores and there is a kink in the bureaucracy that makes a slow change.

Fourth, most of the members like to buy groceries, household appliances, snacks, and drinks. Fifth, if the members cannot pay their responsibility, they will get a warning, and for the time being, all the facilitate in Co-op will be frozen until they pay.

Figure 1 illustrates the Sales Management highlighted by the interviewees in the investigation. It enables us to have a comprehensive perspective on Sales Management in Employee Co-operatives.

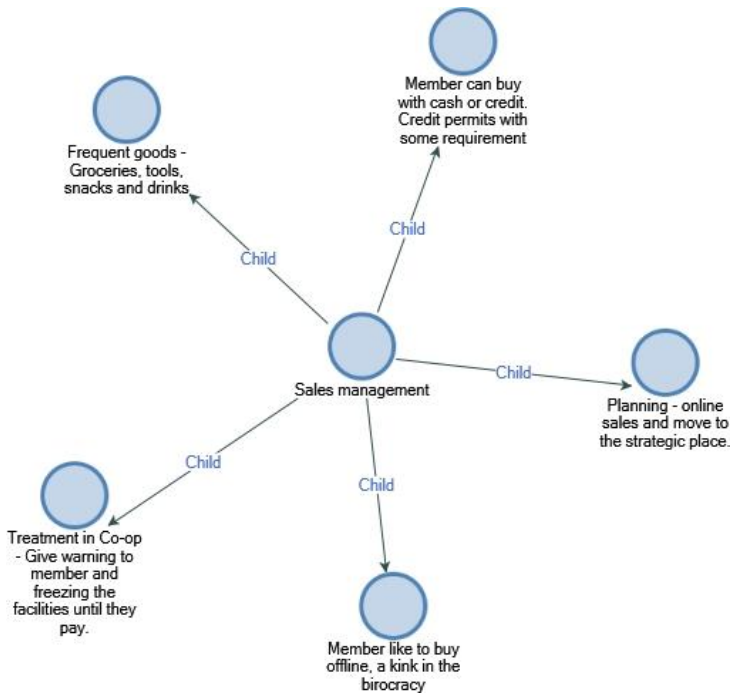

Figure 1: Sales Management

4.4. Inventory Management

Inventory management in Consumer Co-operatives in Figure 2, especially in Employee Co-ops has 6 (six) rules that need to meet if the Producer Co-operatives want to join selling in their place.

1. Product has to meet the standard requirement from the government.
2. The source of the products can be from an Official distributor, wholesale place, or traditional market.
3. For some of the big Co-operatives almost 90% of their products were from Official Distributors, the wholesale place was the second option if the official cannot afford it. But, most of the small co-ops ended by fulfilling their need by buying in the traditional market.
4. Average of the Inventory turnover ratio was around 7 times.
5. Product that were not sold, can be returned back or co-ops make it to discount.
   There are two types of products with entrust systems or closed purchases.
6. Product re-purchase if the market gives positive impacts and the supplier entrusts the product to co-ops.

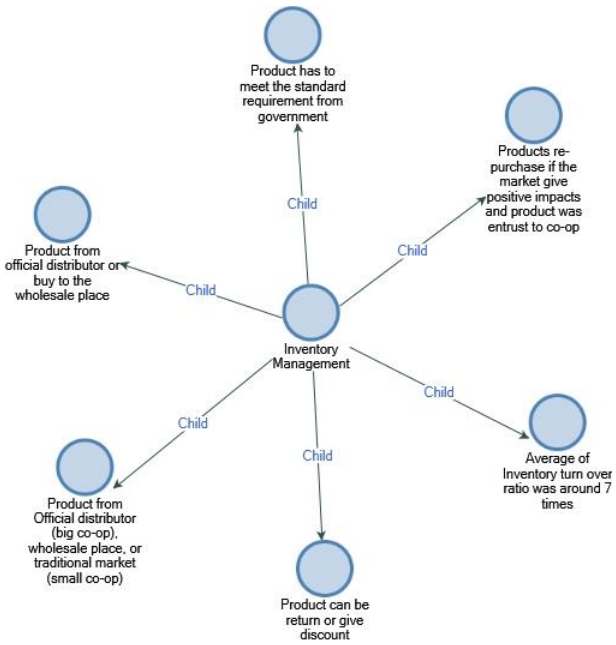

Figure 2: Inventory Management

4.5. Collaboration in the supply chain

For succession collaboration in the supply chain between consumer co-operatives and producer co-operatives have to fulfill four criteria, that shows in in Figure 3, there are:

First, the product has to be good quality products, the price was affordable, and the suppliers have to make a commitment for the after-sales. Second, most of the types of products that were needed by consumers were authentic food from the home industry and groceries. Third, co-ops will be sorting the products based on the administrative requirements and paying attention to expired dates in the products. Finally, the consumer co-ops are open to all collaboration from external environments with suppliers to fulfill the requirement of the products that are allowed to enter.

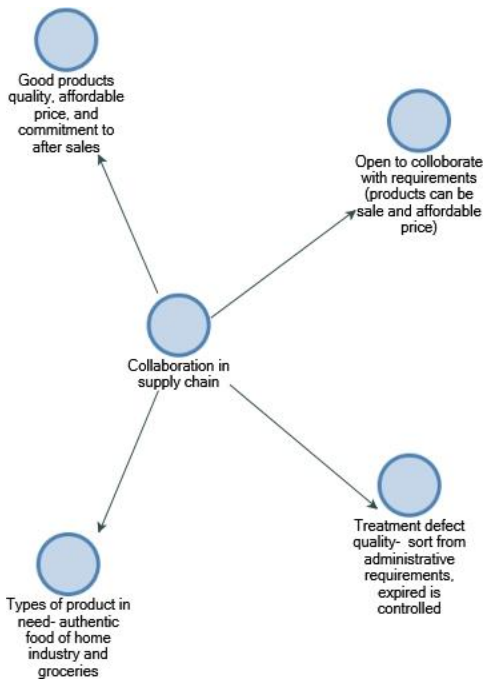

Figure 3: Collaboration in the supply chain

5. Discussion and implication

As a framework for the findings acquired in this research, it can be confirmed that a network of co-operatives, where consumer and producer co-ops collaborate, can be successful if the producer co-ops are willing to cooperate in meeting the standard requirements set by the consumer co-ops. If the supplier possesses a commendable character and a foundation of trust has been established, they are genuinely welcomed. The establishment of a network of co-operatives offers several advantages. However, in order for this to occur, effective coordination is necessary due to the varying preferences, methods, viewpoints, and objectives of the organizations involved. Additionally, there may be instances where these companies may find themselves in competition with one another. (Galvão et al., 2021).

This research aims to examine the elements that have contributed to the formation of cooperative networks inside the cooperative supply chain. Based on the acquired findings, it can be inferred that successful collaboration in the cooperative supply chain is contingent upon the fulfillment of rules by producer co-ops. Furthermore, connections inside co-op networks are characterized by trust, dedication, and effective communication, which play a crucial role in the production of value within these networks.

This paper is expected to have both theoretical and practical implications. This study is expected to contribute to the literature by providing a deeper understanding of the characteristics of consumer co-operatives as a theoretical implication. From a practical standpoint, producer cooperatives need to enhance both their product quality and their conduct in order to achieve the prescribed standard requirements.

During this research, certain limitations were identified, especially related to the qualitative nature of the study. These limitations mostly involve subjectivity, which might manifest in the analysis of findings, coding, and classification system of interviews, despite the implementation of necessary precautions. The recommendation is to pursue quantitative research to achieve generalizability in Indonesia, despite potential cultural barriers.

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Research on the Influence of Self-Efficacy, Training Motivation, and Training Outcomes on the Employment Intentions of Unemployed Youth in Taiwan Government Vocational Training Programs

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Abstract
This study originates from the observation of youth unemployment in Taiwan society and explores whether unemployed youth can successfully transition to the workplace through participation in Taiwan government vocational training. It examines the effects of individual self-efficacy, training motivation, and training effectiveness on employment intentions. The research method utilized a questionnaire survey, with a total of 121 questionnaires collected. SmartPLS and SPSS were used as statistical analysis software to conduct descriptive statistics, reliability and validity analysis, and regression analysis. The empirical results are as follows: self-efficacy has a significant positive impact on training effectiveness: a significant positive impact between self-efficacy and employment intentions; training motivation has a significant positive impact on training effectiveness; training motivation does not have a significant impact on employment intentions; and training effectiveness has a significant positive impact on employment intentions. In addition to the five hypotheses within the research framework, this study also conducted independent sample T-tests, one-way ANOVA, mediation effects, and moderation effects analyses, and got several empirical results as follows: training effectiveness partially mediates the impact of self-efficacy on employment intentions; males generally have higher self-efficacy than females; trainees who attempted to seek employment before training generally have higher employment intentions than those who did not; and trainees aged 25-29 generally have higher employment intentions than those aged 15-19.

Keywords: Vocational Training, Self-Efficacy, Training Motivation, Training Effectiveness, Employment Intentions

1. Introduction

1.1 Introduce the Problem

Unemployment affects individuals in multiple ways. Beyond the loss of income and departure from a structured lifestyle, it significantly impacts psychological well-being, causing feelings of frustration, anxiety, depression, and decreased self-confidence (Vega, 2023). When facing unemployment, the consequences extend beyond the

individual to affect family and societal levels. Studies indicate that unemployment leads to higher divorce rates and issues in child-rearing. The negative impacts of unemployment do not cease once a new job is found; rather, they persist for up to two years (Jin, Shah, & Svoboda, 1995). One research demonstrated that, which tracked 756 job seekers within 13 weeks of unemployment, 71% reported that the negative effects of their initial unemployment experience continued to affect them (Marinescu, Skandalis, & Zhao, 2020).

Maintaining a positive attitude during unemployment influences the success rate of future job searches, a concept known as positive psychological capital. This includes hope, self-efficacy, resilience, and optimism. Self-efficacy, in particular, has a significant positive correlation with individual job performance, highlighting the importance of studying self-efficacy among the unemployed (Judge, Jackson, Shaw, Scott, & Rich, 2007). To escape unemployment, individuals typically take several actions, such as job matching, updating resumes, and enhancing their skills. Unemployment drives the motivation to improve one's capabilities, leading many to participate in vocational training courses with the expectation that these courses will help them secure employment. Thus, understanding the motivation for training and the effectiveness of these training programs is crucial.

1.2 Explore Importance of the Problem

According to Taiwanese government statistics, the unemployment rate is highest among three age groups: 15-19 years, 20-24 years, and 25-29 years, ranging from 6% to 15% (Judge et al., 2007). These numbers indicate that the unemployment issue is significantly more severe among the youth compared to the middle-aged population. To encourage youth employment, the Taiwanese government offers employment incentives and vocational training program, called "The First Industrial Talents." Given that participating in vocational training courses is more beneficial for the overall career development of young people, this study focuses on government-provided vocational training. It investigates the effects of self-efficacy, training motivation, and training effectiveness on the employment intentions of unemployed youth participating in this vocational training program. Therefore, three research goals are demonstrated in this study:

1. Investigate whether vocational training can effectively help unemployed youth secure employment.
2. Examine how different characteristics of trainees' influence training effectiveness and future employment outcomes.
3. Provide guidelines for government training institutions to select suitable youth trainees.

1.3 Describe Relevant Scholarship

The term "self-efficacy" was first introduced within the framework of social learning theory (Rumjaun & Narod, 2020). Social learning theory posits that an individual's behavior is primarily influenced by the interplay between social environment, personal cognition, and personal behavior. An individual's expectations of efficacy primarily derive from mastery experiences, vicarious experiences, verbal persuasion, and physiological and emotional states. Self-efficacy represents an individual's belief in their capability to accomplish a specific task, typically expressed through phrases like "I believe I can" or "I am confident." It reflects a psychological assessment of one's ability to perform a particular behavior. Individuals with higher self-efficacy tend to set more challenging goals for themselves, believing in their capacity to apply learning outcomes and competencies to their work. They persist in their efforts to enhance job performance (Rumjaun & Narod, 2020; Simosi, 2012). Before making career choices, job seekers often engage in self-assessment to select tasks they can competently perform, while avoiding those beyond their abilities. Job seekers with high self-efficacy are more likely to accept challenging tasks, leading to a broader range of job options (Saks, Zikic, & Koen, 2015). Conversely, if job seekers experience repeated failures, their self-efficacy diminishes, the level of task challenge they can accept decreases, and their job options narrow, leading to a vicious cycle of unsuccessful job searching. To counteract the decline in self-efficacy caused by "mastery experiences," job seekers need to boost their self-efficacy through other factors. For example, observing

others successfully finding jobs can foster belief in their own potential success based on “vicarious experiences.” Positive reinforcement and encouragement from others can affirm the job seeker's efforts and current skills, thus enhancing self-efficacy through “verbal persuasion” (Hagen, Gutkin, Wilson, & Oats, 1998). Avoiding mention of past failures is crucial. Additionally, maintaining a structured schedule and rhythm, preserving mental and physical well-being, and experiencing “physiological arousal” can help job seekers feel good about their current state, thereby sustaining high self-efficacy (O'Leary, 1992).

Training motivation refers to the reasons why participants enroll in educational training programs (O'Leary, 1992). By understanding their motivation, we can discern what participants hope to gain from the courses. Tharenou (2001) indicated that training motivation arises from the value expected by the trainees, which, under the influence of learning motivation, generates the willingness to participate in training. Beier and Kanfer (2009) also suggested that training motivation involves the willingness and expectations of trainees to engage in training and development before the course, with the goal of acquiring work-related knowledge and skills. Boshier (1971) proposed congruence model theory for adult learning, stating that the motivation for adults to engage in further education is determined by the degree of interaction between external social factors and internal self-factors. When this balance is disrupted, the drive to restore it leads to the emergence of learning motivation. Boshier categorizes learning motivation into two types: growth motivation and deficiency motivation. Deci and Ryan (1985) introduced the self-determination theory, which posits that an individual’s motivation can be categorized into extrinsic and intrinsic motivation based on the level of self-determination. Ilie (2019) explored the impact of motivation and satisfaction on training effectiveness, using the government-subsidized vocational program as an example. Ilie (2019) also divided training motivation into three types: learning motivation, intrinsic goals, and external expectations. Given that adults have the autonomy to decide whether to participate and which course to enroll in, the training motivation of each individual varies. Therefore, understanding the types of training motivation and the differences in training effectiveness they bring is crucial. Everyone has different learning goals. Such individual learning goals are reflected in their training motivation.

Training effectiveness encompasses the knowledge, skills, and attitudes that employees acquire from educational training, signifying the performance outcomes produced by both employees and the organization through the training process (Dessler, Cole, & Chhinzer, 2015). training effectiveness is reflected in the participants’ satisfaction with various aspects of the training process and the extent to which they enhance their self-capabilities and apply them in the workplace (McCombs, 2012). Training effectiveness represents the extent of learning and acquisition by participants upon the completion of educational training courses. It is a key indicator of whether the costs incurred for the training have yielded corresponding results. The evaluation models for training effectiveness are diverse, including Kirkpatrick's Four-Level Evaluation Model, the CIPP Evaluation Model, Brinkerhoff's Six-Stage Evaluation Model, Bushnell's IPO Model, Holton's HRD Evaluation and Measurement Model, and Phillips' ROI Model. From research study, it can say that the models for evaluating training effectiveness are varied, each with its own methods and logic (Passmore & Velez, 2012; Passmore & Velez, 2014; Reio Jr, Rocco, Smith, & Chang, 2017). Since this study involves surveying the trainees, there is limited information about the resources, facilities, and other investments made by the training organization. Given that many contemporary training evaluation models are extensions and applications of Kirkpatrick's Four-Level Evaluation Model, this study primarily adopts Kirkpatrick's model as the sub-dimension framework for designing the questionnaire on training effectiveness.

Intention is not merely an expression of attitude or cognition; it also represents the degree of willingness to take action. Vallerand, Deshaies, Cuerrier, Pelletier, and Mongeau (1992) defined intention as the subjective inclination of an individual to engage in a specific behavior. Intention signifies a willingness to perform an action or initiate a behavior, providing the motivation to move towards desired goals (Ajzen, 1985). Regardless of educational background, everyone must face their first job search. From choosing schools and majors in the past to selecting companies and careers now, students need references and guidelines to help them find the right answers for themselves. Cullen, Edwards, Casper, and Gue (2014) suggested that employment intention reflects an individual's inclination to seek satisfaction and adaptability in a job, which relates to personal traits and environmental factors.

Douglas and Shepherd (2002) also pointed out that employment intention refers to an individual's career choice based on their abilities, interests, work values, and future career perceptions, representing their intent to achieve future employment goals. The variations and reasons for differences in employment intentions arise from the interplay of factors such as family background, personal characteristics, work values, and social interaction opportunities (Douglas & Shepherd, 2002). Chen, Shen, and Gosling (2021) studied the relationships between workplace competencies, student internship satisfaction, and future employment intentions, surveying students who completed internships in the tourism and leisure industry. The findings showed that students had a high willingness to try jobs in the tourism and leisure sector, scoring an average of 3.93, the highest among the categories. However, Chen et al. (2021) also inferred that the high employment intention among students might be due to their understanding of the industry after more than two years of related coursework. If they lack clear ideas about their future career direction, they are more likely to consider their field of study as a priority for future employment. Conversely, some students experience conflicting feelings after external internships, which can negatively impact their employment intentions.

1.4 State Hypotheses and Their Correspondence to Research Design

Switzer, Nagy, and Mullins (2005) pointed out that self-efficacy has a significant positive impact on training transfer effectiveness. Na-Nan and Sanamthong (2020) also demonstrated that employees' self-efficacy significantly influences training effectiveness. Based on the above literature, this study hypothesizes that self-efficacy is positively related to educational training effectiveness, leading to the first hypothesis: unemployed youth with high self-efficacy will have higher training effectiveness after participating in vocational training.

H1: Self-efficacy has a significant positive impact on educational training effectiveness

Hackett and Betz (1981) found that self-efficacy's predictive value is highly related to individuals' workplace behavior. It can be further inferred that the self-efficacy of unemployed youth influences their level of engagement in employment intentions, affecting their job choices. A research about the impact of tourism and hospitality students' internships on their future employment, found that students with high self-efficacy strive to overcome difficulties during internships and are willing to pursue related industries in the future (Tsai, Hsu, & Yang, 2017). Based on the above literature, this study hypothesizes that self-efficacy is positively related to employment intention, suggesting that unemployed youth with high self-efficacy will have higher employment intentions.

H2: Self-efficacy has a significant positive impact on employment intention

A research about the discussion of the relationship between learning motivation, training effectiveness, and job performance among employees in the high-tech industry, found that employees' motivation to participate in educational training, especially if driven by intrinsic motivation, leads to better behavioral performance in training effectiveness (Shahzadi, Javed, Pirzada, Nasreen, & Khanam, 2014). also explored the influence of training participation motivation on training effectiveness, finding that trainees' motivation significantly positively impacts their training effectiveness. Based on the above literature, this study hypothesizes that intrinsic training motivation is positively related to training effectiveness, leading to the hypothesis that unemployed youth with higher intrinsic motivation will have higher training effectiveness after participating in vocational training.

H3: Training motivation has a significant positive impact on training effectiveness.

Chen et al. (2021) pointed out that vocational training is crucial for a stable employment system, as it prepares individuals for employment, stabilizes jobs, and enhances or stimulates employment and reemployment intentions. Cullen et al. (2014) also found that learning motivation has a significant positive impact on employment intentions, particularly in the sub-dimensions of interest motivation and social motivation. This study hypothesizes that training motivation is positively related to employment intention, suggesting that unemployed youth with strong training motivation will have higher employment intentions.

H4: Training motivation has a significant positive impact on employment intention.

Vocational training aims to assist and enhance the employment skills of the unemployed, thereby promoting national employment (Switzer et al., 2005). Therefore, whether conducted by the central government, entrusted to private training institutions, or subsidized by local governments, the "employment rate" after training is considered

the most important indicator of vocational training effectiveness for the unemployed. According to the literature, training effectiveness positively impacts job performance, job satisfaction, and employee retention rates, highlighting the relationship between training and employment. Since this study focuses on unemployed youth who are not currently employed and who aspire to enter related industries in the future, the study links training effectiveness with employment intention. Based on the above literature, this study hypothesizes that training effectiveness is positively related to employment intention, suggesting that unemployed youth with high training effectiveness will have higher employment intentions.

H5: Training effectiveness has a significant positive impact on employment intention.

2. Method

This study adopts a quantitative research approach, distributing a wide-scale questionnaire to collect opinions from participants in vocational training programs. The objective is to investigate the impact of three major dimensions—self-efficacy, training motivation, and training effectiveness—on employment intentions.

The data collection process involves disseminating questionnaires to a broad audience of vocational training participants. The responses will provide valuable insights into the participants' perspectives and experiences regarding their self-efficacy, motivation for participating in the training, the effectiveness of the training, and their employment intentions. To analyze the collected data, this study employs regression analysis, utilizing statistical software. Regression analysis is particularly suitable for exploring the relationships between multiple independent variables (self-efficacy, training motivation, and training effectiveness) and a dependent variable (employment intention). By applying these statistical tools, the study aims to quantify the effects of self-efficacy, training motivation, and training effectiveness on the employment intentions of unemployed youth participating in vocational training programs.

The purpose of this study is to evaluate the effectiveness of government measures in addressing youth unemployment. Among the six initiatives aimed at encouraging youth employment, the Taiwan government “The First Industrial Talents” training program specifically targets unemployed youth aged 15 to 29 by offering vocational training courses. This aligns with the age group experiencing the highest unemployment rates. Therefore, this study focuses on graduates of the “The First Industrial Talents” program as the primary research subjects.

Based on the outlined objectives, the study population has to meet the following criteria, one is unemployed youth aged 15 to 29, and the other one is participants who have completed the vocational training courses under the “The First Industrial Talents”. By focusing on these criteria, the study aims to accurately assess the impact of the “The First Industrial Talents” on improving employment outcomes for the most affected age group in the youth population.

The questionnaire for this study is based on the research framework and has been adjusted and refined following a review of relevant literature. The finalized questionnaire is divided into five major sections: self-efficacy scale to measure the self-efficacy of unemployed youth; training motivation scale to assess the motivations of participants attending the “The First Industrial Talents” programs; training effectiveness scale to evaluate the effectiveness of the training received during the program; employment intention scale to catch the employment intentions of participants after completing the course; and demographic information to collect basic personal data of the respondents. The questionnaire consists of 44 questions in total.

The research is conducted in two stages to ensure the reliability and validity of the study. A pretest Questionnaire was conducted firstly. Initially, a pretest questionnaire is designed to evaluate the feasibility, validity, and

completeness of the research tools. Feedback from respondents during the pretest phase is collected and analyzed. Based on this feedback, necessary adjustments, additions, or deletions are made to the questionnaire items to improve clarity and relevance. Then a full sample survey was conducted. After refining the questionnaire based on the pretest results, the finalized version is administered to the full sample of the study population. This step ensures that the data collected is comprehensive and reflective of the study's objectives. By following this structured process, the study aims to gather robust data to assess the impact of the "The First Industrial Talents" on the employment outcomes of unemployed youth.

In the preliminary testing phase, this study conducted an online small-sample test, collecting a total of 26 questionnaires. All 26 questionnaires were valid, resulting in a 100% effective response rate. The collected data underwent factor analysis, and items that did not meet statistical standards were removed.

Using the PLS (Partial Least Squares) path model, factor loadings were examined to support each dimension. Items with factor loadings below the threshold of 0.7 were deleted to ensure internal consistency and enhance the explanatory power of the indicators. A total of 14 items were deleted during this phase. After these deletions, a re-execution of statistical analysis confirmed that all factor loadings met the required standards. The revised questionnaire now better reflects the underlying constructs with improved internal consistency.

3. Results

This study distributed an online questionnaire. A total of 127 questionnaires were collected, with 6 incomplete responses excluded, resulting in 121 valid questionnaires. The effective response rate was 95.27%. All participants had experience attending Taiwan government "The First Industrial Talents" program.

In terms of gender distribution, the number of female participants slightly exceeded that of males, with 66 female participants making up 55% of the sample, while the remaining 55 participants were male, comprising 45% of the sample. Regarding age, the largest age group among participants was those aged 25-29 years, accounting for 49% of the sample with 59 participants. The second-largest group was those aged 20-24 years, representing 41% with 50 participants. The smallest age group was the 15-19 years cohort, with only 12 participants, making up 10% of the total.

When examining work experience, the majority of participants had less than one year of work experience, accounting for 31% of the sample. This was followed by recent graduates who had not yet entered the workforce, comprising 24% of the participants. Other categories of work experience were distributed as follows: 13% had 3-5 years of experience, 12% had 1-2 years of experience, and another 12% had 2-3 years of experience. Those with more than five years of work experience were the fewest, representing only 8% of the participants. This distribution suggests that most participants joined the vocational training program within a year after completing their highest level of education.

In terms of educational attainment, a significant majority of participants were university graduates, with 92 individuals holding a university degree, constituting 76% of the sample. The remaining participants were evenly split between those with a high school or vocational school/junior college education and those with postgraduate degrees, each group comprising 12% of the sample. Only one participant had a junior high school education, making up 1% of the total. These results provide a comprehensive overview of the demographic characteristics of the study's participants, highlighting a predominantly young, recently educated cohort with a significant portion having limited work experience.

Analysis of the Impact of Self-Efficacy, Training Motivation, and Training Effectiveness on Employment Intention

The statistical results supported Hypothesis H1: self-efficacy has a significant positive impact on educational training effectiveness (β=0.227, T=3.522, P<0.001). The analysis indicates that higher self-efficacy, or greater confidence in oneself, leads to higher training effectiveness after participating in vocational training. Therefore, Hypothesis H1 is supported by the data. The statistical results supported Hypothesis H2: self-efficacy has a significant positive impact on employment intention (β=0.229, T=2.624, P<0.01). The analysis reveals that higher self-efficacy, or greater confidence in one's learning outcomes, leads to higher employment intentions after completing vocational training. Thus, Hypothesis H2 is supported by the data. The statistical results supported Hypothesis H3: training motivation has a significant positive impact on training effectiveness (β=0.751, T=14.427, P<0.001). The analysis shows that higher training motivation, or a greater desire to gain from the course, leads to higher training effectiveness after participating in vocational training. Therefore, Hypothesis H3 is supported by the data. The statistical results did not support Hypothesis H4: training motivation did not have a significant positive impact on employment intention (β=-0.149, T=1.007, P=0.314 > 0.05). The analysis indicates that training motivation does not significantly influence the employment intentions of participants after completing the vocational training. Therefore, Hypothesis H4 is not supported by the data. The statistical results supported Hypothesis H5: training effectiveness has a significant positive impact on employment intention (β=0.633, T=4.456, P<0.001). The analysis reveals that higher training effectiveness, or greater gains from the course, leads to higher employment intentions after completing the training. Thus, Hypothesis H5 is supported by the data. These numbers are listed as following table:

Hypothesis	Structural Path	Standard Deviation	T-Value	P-Value	Result
H1	Self-Efficacy→Training Effectiveness	0.064	3.522	0.000	Supported
H2	Self-Efficacy→Employment Intention	0.087	2.624	0.009	Supported
H3	Training Motivation→Training Effectiveness	0.052	14.427	0.000	Supported
H4	Training Motivation→Employment Intention	0.148	1.007	0.314	Not Supported
H5	Training Effectiveness→Employment Intention	0.142	4.456	0.000	Supported

To explore whether the positive relationship between self-efficacy and employment intention is mediated by training effectiveness, a mediation effect analysis was conducted using hierarchical regression. In the first step, the coefficient of self-efficacy on employment intention was 0.444. In the second step, the coefficient of self-efficacy on employment intention decreased to 0.214 when training effectiveness was included in the model. This reduction indicates that the effect of self-efficacy on employment intention is partially mediated by training effectiveness. The significant values in the second model confirm that both self-efficacy and training effectiveness independently contribute to employment intention, but the influence of self-efficacy is diminished when accounting for the mediating effect of training effectiveness. This finding substantiates that training effectiveness plays a partial mediating role in the relationship between self-efficacy and employment intention. The statistical results are presented as following:

Model		B	Standard Error	β Value	T Value	Significance
1	(Constant)	2.307	0.331		6.961	0.000

	Self-Efficacy Mean	0.435	0.080	0.444	5.404	0.000
2	(Constant)	0.819	0.392		2.090	0.039
	Self-Efficacy Mean	0.210	0.081	0.214	2.578	0.011
	Training Effectiveness Mean	0.567	0.099	0.478	5.742	0.000

To determine whether gender influences the independent constructs in this study, an independent samples T-test was conducted to assess whether there are differences in the constructs based on gender. The analysis results indicate a significant difference in the self-efficacy construct based on gender. The T-test results show a T value of 2.425 and a P value of 0.017, which is less than the 0.05 threshold for significance. This suggests that there is a statistically significant difference in self-efficacy between males and females. The mean self-efficacy score for males was 4.22, while the mean self-efficacy score for females was 3.92. This indicates that, on average, males have higher self-efficacy compared to females.

Moreover, to understand whether the job-seeking experience of training participants affects any single construct in this study, an independent samples T-test was conducted, similar to the previous analysis on gender. This test evaluates whether there are differences in each construct based on job-seeking experience. The analysis results indicate that job-seeking experience has a significant impact on the employment intention construct. The T-test results show a T value of 3.222 and a P value of 0.002, which is less than the 0.05 threshold for significance. This suggests a statistically significant difference in employment intention between participants with job-seeking experience and those without. The mean employment intention score for participants with job-seeking experience was 4.21, while the mean score for those without job-seeking experience was 3.81. This indicates that participants who have previously attempted to seek employment generally have higher employment intentions compared to those who have not.

To thoroughly understand whether different age groups influence the independent constructs in this study, a one-way ANOVA (Analysis of Variance) was conducted to explore these relationships further. The F value on the employment intention is 4.780 with a P value of 0.010. Since the P value is less than 0.05, there is a significant effect of age on employment intention. There is a significant difference in employment intention between participants aged 15-19 and those aged 25-29. This finding suggests that older participants are generally more ready and willing to enter the workforce after completing vocational training compared to their younger counterparts.

4. Discussion

The hypothesis that self-efficacy positively influences training effectiveness was supported by the data. Individuals with high self-efficacy are confident in overcoming challenges and facing new tasks fearlessly. They are likely to complete assignments given by instructors successfully, signifying that they have internalized new knowledge from the course.

The hypothesis that self-efficacy positively influences employment intention was also supported. The primary goal of vocational training is to prepare participants for employment. Participants are usually those who have completed their education and are not currently employed, encouraging them to select courses related to their desired future careers. Therefore, the period of participating in vocational training often serves as a bridge between school and the workplace. Higher self-efficacy among trainees, even when facing challenges, leads to higher employment intentions.

The hypothesis that training motivation positively influences training effectiveness was supported. Participants with high training motivation are highly engaged in the courses they choose and are eager to gain knowledge from them. This high level of engagement leads to better absorption of new knowledge and higher training effectiveness.

For instance, a participant in the “E-commerce and Digital Marketing Talent Training Program” had a clear goal of learning how to operate social media and plan content, leading to strong learning motivation and excellent training outcomes.

The hypothesis that training motivation positively influences employment intention was not supported by the data. To understand this result, interviews were conducted with participants, revealing varied motivations for attending the courses. Some participants attended the courses out of interest or to learn additional skills, rather than with a direct intention of entering related industries. This diversity in motivations explains the lack of a significant impact on employment intentions.

The hypothesis that training effectiveness positively influences employment intention was supported. Participants who achieved high training effectiveness gained the necessary knowledge and skills for their chosen industry, boosting their confidence and willingness to seek employment in related fields. The "The First Industrial Talents" includes employment counseling courses, such as resume writing and interview skills, enhancing participants' employability and supporting their job search efforts.

Moreover, four findings are demonstrated as following:

The analysis confirmed that training effectiveness partially mediates the positive impact of self-efficacy on employment intention. Even participants with high self-efficacy may experience reduced employment intentions if they encounter difficulties during the training that lower their training effectiveness. This mediation effect highlights the importance of training effectiveness in realizing the potential of self-efficacy.

Furthermore, the study found that male participants generally exhibited higher self-efficacy than female participants. This aligns with Bandura's social learning theory, which posits that behavior is influenced by social environment, cognition, and behavior. In societies with traditional gender roles, such as Taiwan’s historically male-dominated society, males are often expected to be more competent, leading to higher self-efficacy.

Participants aged 25-29 showed higher employment intentions compared to those aged 15-19. This reflects the impact of Taiwan's educational policies, where most students continue their education after junior high school, resulting in a lower number of unemployed youth in the 15-19 age group. Additionally, the low employment intention among this age group is due to their continued focus on education rather than immediate employment.

The study found no significant effects of gender and job-seeking experience on the hypothesis pathways, nor did work experience significantly impact any single construct. This may be due to the narrow age range of participants and the focus on pre-employment vocational training. Future research with a broader range of work experiences could further validate these findings.

The theoretical contributions are that previous studies on vocational training primarily focused on training needs, satisfaction, and effectiveness, rarely incorporating employment intention. By including employment intention in this study, we extend the research framework to understand the factors influencing post-training employment rates, providing a broader perspective on vocational training research.

The practical contributions are that the study findings suggest that self-efficacy enhances employment intentions. Therefore, future trainee selection processes could include self-efficacy assessments alongside pre-course evaluations of relevant knowledge. By understanding trainees' self-efficacy, training motivation, and career aspirations, training programs can better select candidates who are likely to achieve high post-training employment rates, fulfilling the ultimate goal of vocational training initiatives.

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