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Textile and Garment Sector Financial Distress and Its Prediction: A Systematic Indonesia Literature Review

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ABSTRACT

The purpose of this study is to examine the conceptualization of financial distress research in the textile and apparel industries, particularly in terms of research scope and methodology. Furthermore, this article attempts to systematically analyze the network formed by these literatures. In this study, a qualitative approach was used through the literature review method, with 41 specific articles about financial distress in the textile and garment sector serving as the research corpus and drawn from the Litmaps database. To interpret and describe the frequency patterns and relationships visualized using RStudio and Gephi devices, text mining, network analysis, and content analysis were used. This study discovers that a frequently discussed issue is the influence of financial variables, both dependent and independent, on the prediction of financial distress or vice versa, using various quantitative approaches and models of financial distress. This claim is supported by the findings of a systematic analysis, which reveals a positive correlation between global cloud output and network analysis. The corpus aspect of this research is limited, and the research scope is limited to the Indonesian context. Future research with broader literature sources and different types of company sectors is highly anticipated. This literature review can provide a comprehensive framework for researchers and practitioners who are interested in cases of financial distress. Furthermore, this is a recent study that conducts a systematic review of the literature on financial distress in Indonesian textile and garment companies.

Keywords Financial Distress, Textile and Garment Sector, Literature Review, Systematic Network Analysis

1. INTRODUCTION

Methods of assessing the risk of corporate financial distress have long been studied in economic and financial literature. For decades, researchers and practitioners have worked to develop new methods for forecasting financial distress and bankruptcy [1]. Until recently, firm pressure prediction techniques relied on a static single-period model to distinguish between stress and non-stress firms. Prior to the development of the quantitative approach, in the 1930s, a qualitative approach was also used to assess the creditworthiness of certain traders. Beaver's Univariate Analysis, published in 1966, is regarded as the first classic in the field of ratio analysis and bankruptcy classification [2]. Several other works that have also begun to appear include Altman's Multivariate Analysis (1968), The Model of Ohlson (1980), The Model of Zmijewski (1984), and The Neural Networks of Etheridge and Sriram (1997).

Currently, financial ratio analysis is a popular managerial tool as well as a tool for determining a

company's economic activity. In a nutshell, this prediction is based on a functional correlation calculation between the financial ratio and a number of dependent variables. This model is commonly used by investment analysts for a variety of purposes, including predicting profitability, predicting a company's failure, assessing potential risks, and assisting in credit rating. In general, the analysis seeks the most useful financial ratios that provide significant information about future events to be used in models for predicting financial distress or bankruptcy [3,4].

Despite the fact that financial difficulties have changed dramatically over the last decade, owing in part to significant changes in financial law and markets, research on financial distress has previously focused on distress costs and financial restructuring [5]. Financial hardship is a term used in corporate finance to describe a situation in which a promise made to a company's creditors is broken or is difficult to honor. Financial difficulties can sometimes lead to bankruptcy. Companies face financial difficulties as a result of poor management rather than economic stress. As a result, this condition is frequently accompanied by a comprehensive shift in organizational structure within management, governance, and structure. This organizational restructuring is thought to be capable of adding value by making better use of resources [5].

Information about a company's financial stress should be obtained as soon as possible so that financial pressure can be reduced and company bankruptcy avoided [6]. From an academic standpoint, it was noted that the issue of financial distress in companies in various sectors in Indonesia was only begun to be studied in the 1990s and has only recently begun to develop in the 2010s. This research focuses on economic and financial literacy. This issue, in particular, has only recently gained traction in the textile and apparel industries (see figure 2).

This sector is becoming increasingly interesting to study, particularly in light of the Covid-19 pandemic, which is thought to have impacted a company's financial distress in most sectors [7,8]. Previously, the textile and garment market conditions were quite depressed as a result of recent trade wars and pressure from producers from other countries, which resulted in price wars. In fact, the textile and garment sector, like other sectors, deteriorated during the Covid-19 pandemic, with the imposition of various activity restrictions and social distancing. However, this industry can make a comeback by repurposing its products as PPE (Personal Protective Equipment).

Twelve companies with positive working capitals are listed on the Indonesia Stock Exchange (IDX) in the textile and garment sub-sector (see table 1). This means that their assets are currently sufficient to pay their current debts. Meanwhile, the other four companies have negative working capital, which means that their assets cannot currently pay their current debts.

The company's health is important for increasing efficiency in running its business so that the ability to earn profits can be increased while avoiding the possibility of bankruptcy (liquidation) in the company. The occurrence of liquidation or bankruptcy in several companies will, of course, result in a number of issues involving the owners and employees who lose their jobs.

This phenomenon encourages researchers to investigate the most recent trends in financial distress research, particularly in Indonesia's textile and garment sub-sector. This study, in particular, has several goals, including analyzing the "framing" of financial distress research in the textile and garment sector, particularly in terms of research scope and methodology. Furthermore, this article attempts to systematically analyze the network formed by these literatures.

There appears to be no systematic review of the literature by Indonesian researchers in this field, especially given that this research also experimented with text mining and network analysis methods. This study's findings are expected to provide a comprehensive picture of the most recent developments in the study of financial distress in Indonesia, particularly in the textile and garment sub-sector. Furthermore, this paper can be used as a reference for practitioners who want to know what approaches and methods academics and practitioners have used to predict financial distress in Indonesian companies.

Table 1. Financial Condition of Textile and Garment Sub-Sector

No	Code	Name	Working Capital	Retained Earnings	EBIT	Equity Market Value	Book Value of Accounts Payable	Sales	Total Asset
1	BELL	Trisula Textile Industries Tbk	127.632.625.516	93.379.714.796	5.298.165.687	152.252.316.799	342.455.321.568	157.718.886.380	623.415.338.649
2	ERTX	Eratex Djaja Tbk	2.363.255	10.028.584	781.508	20.141.658	54.947.538	25.857.349	75.089.196
3	ESTI	Ever Shine Tex Tbk	2.478.019	- 68.752.787	- 314.357	13.242.371	44.552.056	7.874.088	57.794.427
4	HDTX	Panasia Indo Resources Tbk	- 255.163.118.000	- 1.885.029.188.000	- 31.818.676.000	38.641.899.000	380.770.657.000	3.106.084.000	419.412.556.000
5	INDR	Indo-Rama Synthetics Tbk	37.948.667	222.442.805	4.473.343	375.755.541	409.685.745	183.414.950	785.441.286
6	MYTX	Asia Pacific Investama Tbk	- 1.079.688.000.000	- 2.790.736.000.000	- 1.488.000.000	393.767.000.000	3.976.403.000.000	556.344.000.000	4.370.170.000.000
7	PBRX	Pan Brothers Tbk	451.860.472	104.863.229	577.386	264.785.076	358.934.916	121.655.179	623.719.992
8	POLY	Asia Pacific Fibers Tbk	- 964.421.693	- 2.197.054.069	5.036.195	- 937.041.585	1.175.393.696	87.430.962	238.352.111
9	RICY	Ricky Putra Globalindo Tbk	234.122.745.885	53.782.545.864	- 41.311.399.615	414.198.450.722	1.164.853.938.605	321.101.134.959	1.579.052.389.327
10	SRIL	Sri Rejeki Isman Tbk	734.588.589	425.663.319	30.595.135	622.213.737	964.227.176	316.615.378	1.586.440.913
11	SSTM	Sunson Textile Manufacture Tbk	103.601.114.061	- 158.702.126.267	4.829.720.353	203.912.975.724	254.294.612.854	103.379.499.739	458.207.588.578
12	STAR	Star Petrochem Tbk	489.592.894.190	10.186.266.478	171.018.912	490.187.186.456	90.160.937.202	507.489.524	580.348.123.658
13	TFCO	Tifico Fiber Indonesia Tbk	83.991.014	- 1.135.800	162.449	289.722.387	20.767.158	46.146.147	310.489.545
14	TRIS	Trisula International Tbk	350.717.840.963	93.919.539.165	9.622.432.981	667.326.876.574	591.202.232.510	344.044.704.395	1.258.529.109.084
15	UNIT	Nusantara Intri Corpora Tbk	- 583.833.331	26.625.473.166	325.321.502	246.979.605.182	117.068.678.736	39.799.921.556	364.048.283.918
16	ZONE	Mega Perintis Tbk	123.708.594.686	123.095.971.790	- 4.353.662.417	287.000.016.096	326.224.476.162	107.930.377.662	613.224.492.258

Source: Adopted from IDX. data, 2020

2. Literature Review

2.1. Financial Management Dan Financial Distress

Financial management is all activities or company activities related to how to obtain working capital funding, use or allocate funds, and manage assets owned to achieve the main goals of the company. The main purpose of financial management is to maximize the value owned by a company or to add value to the assets held by the shareowner [9–11]. Predicting the survival of the company is very important for management and company owners to anticipate the possibility of potential bankruptcy. Financial distress itself is a condition in which the company's finances are in an unhealthy state or a crisis that occurred before bankruptcy. Bankruptcy itself is usually defined as a situation or situation where the company fails or is no longer able to fulfill the debtor's obligations because the company experiences insufficient funds to run or continue its business [1,12–14]. The financial distress model needs to be developed because knowing the company's financial distress from an early age is expected to take actions to anticipate that it will lead to bankruptcy.

2.2. Text mining and Content Analysis

This research also makes use of a text mining technique known as Knowledge Discovery in Databases (KDD). This method was chosen because the primary source of data was text-based scientific articles. This method is divided into two stages, the first of which is the processing and integration of unstructured data. Second, statistical data generated by text content extraction are analyzed [15]. Meanwhile, the network analysis method, which is part of the Social Network Analysis, is used to visualize the relationships (edges) between words (nodes) using graphical software. The output of the

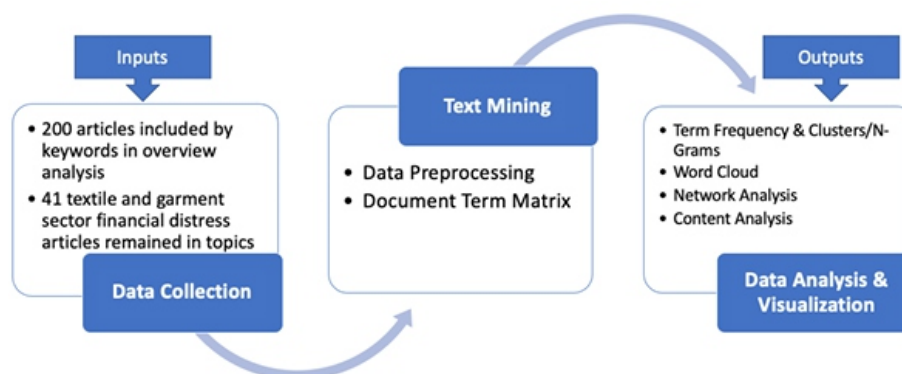
engine analysis (in this case, the AntConc, RStudio, and Gephi software) is then interpreted using content analysis, which can dissect data statistics in great detail [16].

2.3. Literature Review

The literature review approach in this study uses literature based on the Litmaps search engine. A critical analyzing method is then used in dissecting the topic of financial distress through various bibliographies [17–19]. This approach is quite popular and has been used in various fields [16,20–23].

3. Method

In this study, a qualitative approach [24] was used through the literature review method [17–19]. The text mining method is specifically adopted to study literature in the form of text [15,25] gathered through a web-scraping technique on Litmaps database with the keyword “financial distress” on “textile and garment” sector, with context boundaries in Indonesia (see image 2). This stage is followed by extracting article information in the form of text which is useful from the aspects of research scope and methodology [15,26–30]. Furthermore, AntConc software is used to generate an output in the form of term frequency, clusters/N-grams, and word cloud through RStudio software [31,32]. Data output is then used as nodes and edges for network analysis purposes [33–35] using Gephi software and qualitative content analysis [16]. While the source of the case study data comes from the IDX, with the purposive sampling method [36,37] on the financial statements of the textile and garment sub-sector companies in 2019 and the first quarter of 2020.



Source: The author's own study, 2021

Figure 1. Research framework based on literature review

3.1. Data Collection

The corpus of this research was built using a web-scraping technique which was selected using identified keywords [21] from 200 articles to 41 articles specifically concerning financial distress in the textile and garment sector (see figure 2). The data collected and tabulated include aspects of research scope and methodology, which are then stored in text format (txt.) for text mining, analysis, and visualization processes.

3.2. Text Mining

To identify patterns or information, data collection is then explored and analyzed through two stages; data pre-processing and document term matrix (DTM) [38,39]. For the first stage, data pre-processing

and document term matrix (DTM) [38,39]. For the first stage, data pre-processing is conducted through data cleaning, data integration, data transformation, tokenization, and normalization [32,40]. The second stage is building DTM that identifies word frequency or token and clusters based on text data (corpus) that are ready using the AntConc device [41,42].

The processed text data (DTM) is then visually represented as a Word cloud. The RStudio tool is then used to illustrate the frequency of appearance of words on scales that are grouped by topic and aspect. The corpus used was classified based on the scope and methodology of the financial distress research. The following are the commands used to generate data. #Generate the Word cloud set.seed(1234) wordcloud(words=d\$word,freq = d\$freq, min.freq = 3,max.words = 70, random.order = FALSE, rot.per = 0.65,colors = brewer.pal(6,"Dark2")) Word cloud has a minimum word frequency of 3 and a maximum number of words displayed randomly of 70.

3.3. Data Analysis and Visualization

Term frequency review results found that a total of 994 words list (token) treated as Nodes, with the highest frequency (257) is perusahaan (company) and the lowest (1) being usaha (effort). While n-grams tools can scan the entire corpus to classify the word 'n' used to find common expressions in the corpus [41]. Each n-gram showed in this research uses a size range of 2 at minimum and maximum (word count). This review has found 2.383 pairs of (n-gram) treated as Edges for network analysis processes, such as financial-distress, textile-garment (tekstil-garmen), company-textile (perusahaan-tekstil), stock-exchange (bursa-efek), (terdaftar-bursa). and registered-stock

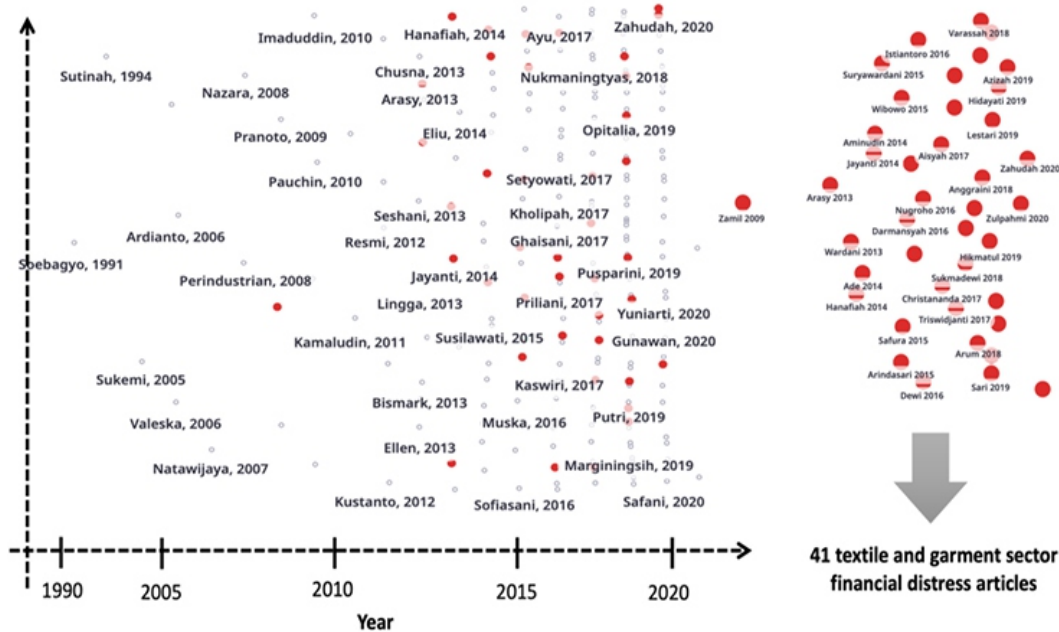
The word cloud designed using the RStudio device (Team, 2013) is aimed to visualize the frequency of occurrence of words freely based on a scale based on research scope and methodology [30,32]. While the network analysis is conducted in several stages such as visualization, exploration, and manipulation of a network of words (token) using the Gephi software or open-source application [35,43]. Statistical calculations in this analysis include network properties, such as Average Degree Distribution, Network Diameter, average path length, and modularity [44].

Content analysis is then conducted to interpret and describe the pattern of frequency and correlation that has been visualized through RStudio and Gephi tools. This analysis is supported by several references related to financial distress in the textile and garment sector.

4. Result and Discussion

4.1. Corpus Profile

Figure 2 shows that the literature on financial distress began to be collected in the early 1990s, or in 1991. This has accelerated since 2010 and continues to this day (2021). While statistics from the textile and garment industry show that literature began to be recorded in 2009 and increased in 2014. This distribution demonstrates that academics and practitioners are becoming more aware of the significance of the financial distress issue. Given the development of a relatively new issue in Indonesia, compared to the beginning of the global discussion (in 1966) [2], it is very interesting to examine the context and approach that is frequently used by Indonesian researchers and practitioners in relation to the issue of financial distress in the textile and garment industries.



Source: Litmaps database, 2021

Figure 2. Trends in the distribution of financial distress literature between the general sector, textiles, and garments from 1991-2021

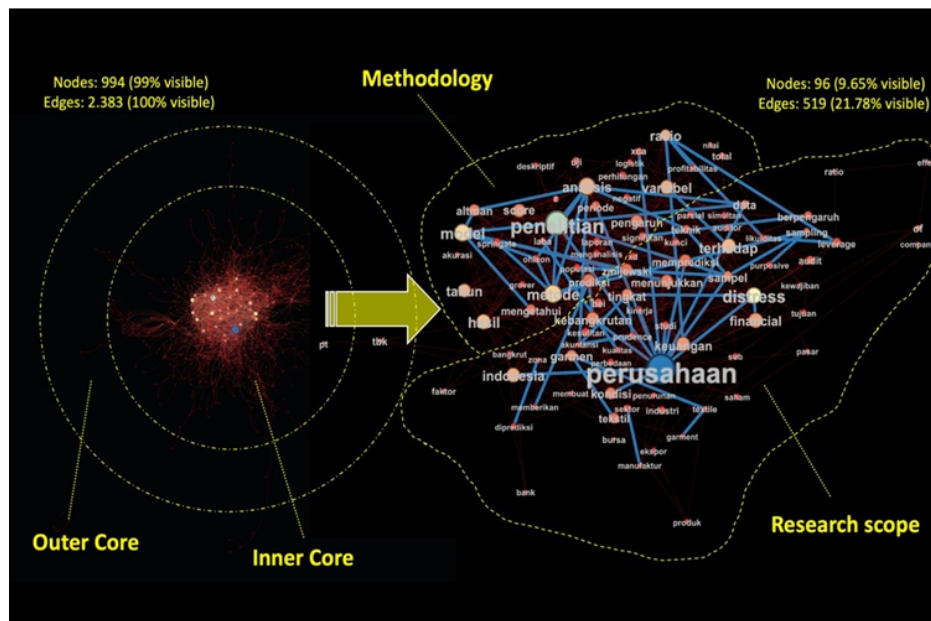
4.2. The Recent Trend of Textile and Garment Sector Financial Distress Study

Furthermore, this study employs 41 financial distress works of literature on the textile and garment sector as a corpus to be examined in terms of research scope and methodology. Based on the corpus, the text mining process generates word frequency or DTM. The most frequent occurrence is regarded as the most frequently discussed issue, and it serves as the main framing of the topic of financial distress in the textile and garment sector. DTM will be used as input in the network analysis process, in addition to reviewing the most frequently discussed issues.

4.3. Financial Distress Research Scope and Methodology in the Textile and Garment Sector

The word list statistic results based on the aspects of research scope and methodologies (see Figure 3) show that the two are related. This means that the approach used in the literature is closely related to the issues or cases discussed based on article titles. This argument is supported by the calculation of term frequency which shows that the 20 tokens with the highest frequency in the research scope aspect include perusahaan (company, 37), tekstil (textile, 35), distress (30), financial (30), terdaftar (registered, 28), bursa (exchange, 27), efek (stock, 27), garmen (garment, 27), Indonesia (27), analisis (analysis, 23), studi (study, 19), score (16), memprediksi (predict, 15), periode (period, 15), altman (14), model (13), pengaruh (impact, 13), prediksi (prediction, 11), rasio (ratio, 11), and sektor (sector, 11). While from the methodology aspect there are penelitian (research, 65), perusahaan (company, 53), metode (method, 43), data (41), sampel (sample, 41), analisis (analysis, 32), teknik (technique, 30), tekstil (textile, 30), score (29), garmen (garment, 27), sampling (21), model (20), purposive (19), altman (17), bursa (exchange, 16), efek (stock, 16), Indonesia (16), terdaftar (registered, 16), distress

Based on a statistical analysis review of network properties, the average degree distribution and average weighted degree values generated in the financial distress dataset in the textile and garment sector are 4.795 and 4.978, respectively. That is, as the value increases, it can be assumed that the number of connections one node has to other nodes on a network improves. Network Diameter [44] or the measurement used to detect the diameter in the text network with the measurement technique to find nodes with the most distant relationship, shows a value of 15 with a radius of 1, and the average distance between nodes or the average path length [47] is 4.035 [44]. Meanwhile, the Modularity and Modularity resolution score calculations both show the number 0.500 with the number of communities or clusters in the network as many as 20. Yifan Hu's layout was chosen as the network analysis visualization model in this study, with 994 nodes and 2.383 edges of the relationship between nodes.



Source: Gephi-based data analysis, 2021

Figure 4. Network analysis of financial distress review in textile and garment sector

Figure 4 depicts a network analysis review of node relationships, which are clustered into two networks, an inner core and an outer core. The inner core is made up of clusters with the highest node occurrence frequency and edge weight. This is the main frame on the subject of financial distress in textile and garment companies. Clusters with a low node occurrence frequency and smaller edge weights, on the other hand, are classified as the outer core. In short, the outer core can be characterized as a zone of discourse with little or no relevance to this topic. The network analysis results also show that the inner core network is made up of research scope and methodology aspects. The weights of the nodes and edges of these two aspects can be seen in the size or scale of the circle, line, and font. The larger the circle and font visualization, as well as the thickness of the line connecting the nodes, the greater the weight or degree. In other words, large-scale nodes and edges indicate issues that are central to the framing or are frequently discussed in the context of financial distress in textile and garment companies. The relationship between nodes is also confirmed by providing labels for nodes, which are displayed as token identities on visualization.

This study discovered a link between word cloud output and network analysis. Despite the fact that the two frequently depict the same framing, network analysis has the advantage of visualizing the relationship between the issues being discussed. This output contributes significantly to the data interpretation. From the standpoint of research scope, this review demonstrates a correlation pattern

that exemplifies the relevant discussion with the impact of financial variables on the prediction of financial distress, or vice versa. Financial ratios, stock returns, liquidity ratios, activity ratios, profitability ratios, leverage ratios, debt ratios, auditors' opinions, and current ratios are some of the dependent and independent financial variables that frequently appear and are interconnected. According to the majority of the literature, financial stress is a stage in which the company's financial condition deteriorates, which begins with liquidity difficulties experienced by the company and, if allowed to continue, leads to company bankruptcy. As case studies, they frequently use the financial statements of textile and garment companies listed on the Indonesian stock exchange. This is understandable given that the Indonesia Stock Exchange (IDX) is a party that organizes and provides a legal system and amenities to bring together Stock transaction activities of other parties in order for them to trade Stocks.

In terms of methodology, the network analysis reveals a few commonly used approaches, including the Ohlson score (o-score) model, Altman z-score, Springate, and Zmijewski, as well as multiple linear regression analysis techniques and the use of SPSS tools. Pozzoli [2] contended that the aforementioned models have their own characteristics. He stated that the Ohlson score (1980) and Zmijewski (1984) were created for a variety of reasons, including analyzing binary dependent variables, assisting in the development of non-linear regression models with the cumulative distribution function assumption, providing company financial distress probability and significance predictor, and not requiring any assumptions regarding distribution predictor. While the Altman model (1968) examines two or more variables at the same time and assumes a multivariate normal distribution and variance-covariance metrics. This function is then used to justify the use of the Z-score method in the analysis of this research case study. The Beaver model (1966), Deakin (1972), Edmister (1972), Moyer (1977), Zavgren-Logit (1985), and Holmen (1988) are theoretical models that have not been widely used by this corpus [2].

5. Conclusions

This study concludes that, while the issue of financial distress in the textile and garment sector is still relatively new, it has piqued the interest of many academics and practitioners. Furthermore, based on the research scope and methodology, this study discovered that the dominantly discussed topic is related to the impact of financial variables, which are either dependent or independent of the prediction of financial distress, or vice versa. The most common approach is quantitative, and it employs various models of financial distress. This phenomenon demonstrates how academics and practitioners in Indonesia are still searching for the right formula to predict financial distress, particularly in cases involving textile and garment sector companies. The network analysis result, which shows a positive correlation between word cloud outputs and network analysis, supports this conclusion. Despite the fact that the two frequently have the same framing, network analysis has the advantage of being able to visualize the correlations between the issues being discussed. This output has a significant impact on data interpretation.

The corpus aspect of this research is limited, and the research scope is limited to the Indonesian context. Future research with broader literature sources and different types of company sectors is highly anticipated. This study's systematic review of the literature can at least provide a comprehensive framework for the issue of financial distress in Indonesian textile and garment sector companies. Furthermore, this is a recent study that conducts a systematic review of the literature on financial distress in Indonesian textile and garment companies.

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REFERENCES

- [1] Bae JK. Predicting financial distress of the South Korean manufacturing industries. 2012;39(10):9159–65. *Expert Syst Appl*.
- [2] Pozzoli M, Paolone F. *The Models of Financial Distress*. In: *Corporate Financial Distress*. Springer; 2017. p. 11–28.
- [3] Pindado J, Rodrigues L, de la Torre C. Estimating financial distress likelihood. *J Bus Res*. 2008;61(9):995–1003.
- [4] Sayari N, Mugañ CS. Industry specific financial distress modeling. *BRQ Bus Res Q*. 2017;20(1):45–62.
- [5] Wruck KH. Financial distress, reorganization, and organizational efficiency. *J Financ Econ*. 1990;27(2):419–44.
- [6] Hastuti E. *Analysis of the Effect of Stock Split on Stock Liquidity and Stock Return [PhD Thesis]*. Universitas Muhammadiyah Surakarta; 2010.
- [7] Crespi-Cladera R, Martín-Oliver A, Pascual-Fuster B. Financial distress in the hospitality industry during the Covid-19 disaster. *Tour Manag*. 2021;85:104301.
- [8] Roll S, Despard M. *Income Loss and Financial Distress during COVID-19: The Protective Role of Liquid Assets*. Available SSRN 3733862. 2020.
- [9] Musthafa H, SE M. *Financial management*. Publisher Andi; 2017.
- [10] Setia Mulyawan S. *Financial management*. Pustaka Setia; 2015.
- [11] Wintoro D. *Exploration of Green Business Financial Management Goals*. *J Keuang Dan Perbank*. 2012;16(1).
- [12] Arista MT. *Comparative analysis of the Altman z-score and Springate methods in predicting financial distress (empirical study on food and beverage companies listed on the IDX for the period 2014-2016)*. [PhD Thesis]. University Bangka Belitung; 2018.
- [13] Opler TC, Titman S. Financial distress and corporate performance. *J Finance*. 1994;49(3):1015–40.
- [14] Whitaker RB. The early stages of financial distress. *J Econ Finance*. 1999;23(2):123–32.
- [15] Loureiro SMC, Guerreiro J, Ali F. 20 years of research on virtual reality and augmented reality in tourism context: A text-mining approach. *Tour Manag*. 2020;77:104028.
- [16] Qian J, Shen H, Law R. Research in sustainable tourism: A longitudinal study of articles between 2008 and 2017. *Sustainability*. 2018;10(3):590.
- [17] Knopf JW. Doing a literature review. *PS Polit Sci Polit*. 2006;39(1):127–32.
- [18] Randolph J. A guide to writing the dissertation literature review. *Pract Assess Res Eval*. 2009;14(1):13.
- [19] Booth A, Sutton A, Papaioannou D. *Systematic approaches to a successful literature review*. 2016;
- [20] Bramwell B, Higham J, Lane B, Miller G. *Twenty-five years of sustainable tourism and the Journal of Sustainable Tourism: looking back and moving forward*. Taylor & Francis; 2017.
- [21] Niñerola A, Sánchez-Rebull M-V, Hernández-Lara A-B. Tourism research on sustainability: A bibliometric analysis. *Sustainability*. 2019;11(5):1377.

- [22] Richards G. *Cultural tourism: A review of recent research and trends*. *J Hosp Tour Manag*. 2018;36:12–21.
- [23] Yuan Y, Tseng Y-H, Ho C-I. *Tourism information technology research trends: 1990-2016*. *Tour Rev*. 2019;
- [24] Jonker J, Pennink B. *The essence of research methodology: A concise guide for master and PhD students in management science*. Springer Science & Business Media; 2010.
- [25] Gan Q, Ferns BH, Yu Y, Jin L. *A text mining and multidimensional sentiment analysis of online restaurant reviews*. *J Qual Assur Hosp Tour*. 2017;18(4):465–92.
- [26] Allahyari M, Pouriyeh S, Assefi M, Safaei S, Trippe ED, Gutierrez JB, et al. *A brief survey of text mining: Classification, clustering and extraction techniques*. *ArXiv Prepr ArXiv170702919*. 2017;
- [27] Kuhzady S, Ghasemi V. *Factors influencing customers' satisfaction and dissatisfaction with hotels: A text-mining approach*. *Tour Anal*. 2019;24(1):69–79.
- [28] Li J, Xu L, Tang L, Wang S, Li L. *Big data in tourism research: A literature review*. *Tour Manag*. 2018;68:30123.
- [29] Mahr D, Stead S, Odekerken-Schröder G. *Making sense of customer service experiences: a text mining review*. *J Serv Mark*. 2019;
- [30] Salloum SA, Al-Emran M, Monem AA, Shaalan K. *Using text mining techniques for extracting information from research articles*. In: *Intelligent natural language processing: Trends and Applications*. Springer; 2018. p. 373–97.
- [31] Ainin S, Feizollah A, Anuar NB, Abdullah NA. *Sentiment analyses of multilingual tweets on halal tourism*. *Tour Manag Perspect*. 2020;34:100658.
- [32] Cherapanukorn V, Charoenkwan P. *Word Cloud of Online Hotel Reviews in Myanmar for Customer Satisfaction Analysis*. In: *2017 6th IIAI International Congress on Advanced Applied Informatics (IIAI-AAI)*. IEEE; 2017. p. 447–52.
- [33] Borgatti SP, Everett MG, Freeman LC. *Ucinet*. *Encyclopedia of social network analysis and mining*. New York: Springer Science & Business Media; 2014.
- [34] Goodall KT, Newman LA, Ward PR. *Improving access to health information for older migrants by using grounded theory and social network analysis to understand their information behaviour and digital technology use*. *Eur J Cancer Care (Engl)*. 2014;23(6):728–38.
- [35] Grandjean M. *Gephi: Introduction to network analysis and visualisation*. 2015;
- [36] Sugiyono. *Quantitative and Qualitative Research*. Bandung: Alfabeta.; 2015.
- [37] Sugiyono P. *Action Research, dan Penelitian Evaluasi) Management Research Methods (Quantitative Approach, Qualitative, Combination (Mixed Methods), Action Research (Action Research, and Evaluation Research)*. Bandung: Alfabeta Cv; 2016.
- [38] Meyer D, Hornik K, Feinerer I. *Text mining infrastructure in R*. *J Stat Softw*. 2008;25(5):1–54.
- [39] Salloum SA, Al-Emran M, Monem AA, Shaalan K. *A survey of text mining in social media: facebook and twitter perspectives*. *Adv Sci Technol Eng Syst J*. 2017;2(1):12733.
- [40] Jaichandran R, BASHA CB, Shunmuganathan KL, Rajaprakash S, RAJA SK. *Sentiment Analysis of Movies on Social Media using R Studio*. *Int J Eng Adv Technol*. 2019;8(6):2171–5.
- [41] Anthony L. *AntConc (Windows, Macintosh OS X, and Linux)*. *Recuperado Httpwww Antlab Sci Waseda Ac JpsoftwareREADME AntConc3*. 2011;2.
- [42] Anthony L. *AntConc: design and development of a freeware corpus analysis toolkit for the technical writing classroom*. In: *IPCC 2005 Proceedings International Professional Communication Conference, 2005*. IEEE; 2005. p. 729–37.
- [43] Lutfiani PA. *Gephi: Social Network Visualization [Internet]*. Medium. 2020 [cited 2021 Mar 30]. Available um.com/gephi-social-network-visual.

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- [44] Jackson MO. *Social and Economic Networks*, Princeton, NJ: Princeton Univ. Press; 2008.
- [45] Aisyah N, Kristanti F, Zutilisna D. *The Influence of Liquidity Ratios, Activity Ratios, Profitability Ratios, and Leverage Ratios on Financial Distress (Case Study on Textile and Garment Companies Listed on the Indonesia Stock Exchange in 2011-2015)*. *EProceedings Manag.* 2017;4(1).
- [46] Hikmatul L. *Analysis Of The Effect Of Profitability, Liquidity And Leverage In Predicting Financial Distress (Empirical Study On Textile And Garment Industry Companies Listed On The Indonesia Stock Exchange In 2012-2014) [PhD Thesis]*. Universitas Wahid Hasyim Semarang; 2019.
- [47] Sari IAN, Oetomo HW. *The Effect Of Leverage, Liquidity And Auditor's Opinion On The Financial Distress Of Textile And Garment Companies In Bei*. *J Ilmu Dan Ris Manaj JIRM.* 2019;8(2).

The Growth and Profitability of Life Insurance Industry in India – A Comparative Analysis between Public and Private Sector Companies

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ABSTRACT

Life Insurers are operating in the public and private sectors in India. A substantial number of policyholders have invested their income in these companies. A company with a proper investment policy and profitability along with the safety of the funds will grow and sustain in the long run. This study aims to help prospective policyholders in choosing a growing life insurer to ensure the safety of their premium money and increased bonus at the time of maturity/claim. Moreover, the present study may provide useful tips for the newly added private sector companies in the industry. The current study reflects on Private Sector Life Insurers to learn from the consistent and smooth growth in profitability of the Public Sector and search for solutions. This paper also compares the investment profitability and profit analysis of the private and public sector insurance companies located in India. Profitability was measured using investment yield and income as two variables. Data collected from life insurance companies operating in India from 2010-11 to 2020-21 was compared. The secondary data was obtained from the companies' annual reports for analysis and comparison. Data was analyzed by using T-Test and significance was determined at 5% confidence. Equal and unequal variances were determined by using the F-Test. The results showed growth in the amount, income, and yield of investment of the Public and Private sectors, but the two sectors did not significantly differ in their investment. By observing the pattern of growth and consistency of public sector, private sector life insurance companies can improve themselves. The study particularly belongs to India but the results and findings can be used by other life insurance companies operating in different countries as well.

Keywords Life Insurance, Public Sector, Private Sector, India, Investment Growth, Investment Profitability

1. INTRODUCTION

It is well known that establishing and developing an insurance sector in a country leads to establishing a causal relationship with the country's economic growth [1]. Hence, to understand the economic growth of a nation, the growth of insurance companies must be looked upon. Experiencing significant growth at the rate of 32-34% per year, the Indian insurance industry became the 5th largest industry in the emerging global market of insurance [2]. The credit for such an advancement goes to the revolutionary structural changes that took place in the Indian life insurance sector in the year 2000. The changes helped the sector to become more organized, smooth, and competitive in the international market. The dominance of the public sector life insurance (PuSLI) companies started diminishing with more and more introduction of private sector life insurance (PvSLI) companies, which has made significant structural changes in the industry [3]. Regulatory authorities have ensured that financial liabilities and performances of life insurance companies must be fair and healthy since they were considered investment custodians of individuals [4]. The companies who have raised funds during a certain period must explore different avenues to invest. The funds raised in a limited duration determine the nature

of the investment, hence, non-life insurers reserve short-term insurance for short-term investment to maintain liquidity. However, life insurance companies can invest their funds for sufficiently longer periods because their insurance reserves are for longer durations. However, the unconscious use of insurance reserves by insurance companies may cause a lack of funds to cover insurance claims [5]. It is, therefore, to safeguard the returns, safety, and liquidity, these companies must prudently invest the funds [6]. Policy formulation and investment administration are distinct phenomena, but a strong interrelationship exists and was observed by most life insurance companies, consequently, investment administration is considered responsible for policy formulation [7].

2. Review of Literature

While using an increased number of offices, renewed policies, underwritten premiums, and individual and group death claims as parameters, Nagalaxmi and Mathiraj [8] studied the growth and performance of life insurance sectors from 2013 to 2018. Nagalaxmi and Mathiraj [8] reported Compound Annual Growth Rate (CAGR) of the Premium underwritten by Life Insurance Corporation (LIC) to be 0.0676 as against 0.1269 for the PvSLI companies. Verma and Bala [9] presented a research paper on emerging horizons in business management in India at a national conference on the growth of insurance companies during India's pre- and post-liberalization. The new policies issued, premium underwritten, insurance penetration and insurance density were used by them as variables. The study was divided into two periods: pre-liberalization (1988-89 to 1999-2000) and post-liberalization (2000-01 to 2011-2012). The Annual Growth Rate (AGR) and CAGR of the two periods were compared and the hypothesis was tested at 5% confidence. The authors found a significant difference between the CAGR in terms of total premium underwritten from one period to the other. Devanand and Prasad [10] used number of offices, commission expense ratio and operating expenses ratio in addition to the number of policies and amount of premium underwritten as variables to measure the performance of insurance companies. They concluded that many private players entered the insurance market to promote their sales, but public sector insurance companies showed preponderance leading the market as an emerging leader. Parida and Acharya [11] suggested a panel data model to find factors determining the efficiency-driven profitability of Indian insurance companies. They found firm size, leverage, GDP, and inflation as significant profitable determinants. On the other hand, they cited underwriting risks, market structure, and efficiency as insignificant determinants of profitability. While studying the impact of several determinants of Investment by the LIC (India) over 14 years (2011 to 2014), Nikita [12] found that underwritten premiums and claims positively impacted the investment of LIC (India). Adam [13] reported a positive correlation between the investment earnings of life insurance firms and their organizational structures in New Zealand, which corroborated with the company size, predominance, leverage, and underwriting risks involved. According to them, LIC companies holding proportionately more financial assets have higher investment yields than those having low investment yields. Similarly, Chen and Hamwi [14] found reinsurance companies in the USA to have higher mean values of yield on investment than other primary insurance companies. Over five years (2016 to 2020), Husain [15] made comparisons of the beneficial position of Indian PuSLI & PvSLI companies. In his comparative study, the ratio of premiums underwritten by private companies was different from the public sector companies. While making a comparative analysis of public and private companies in India, Kumar and Singh [16] found significant differences between premium income, paid benefits, market share, and new individual policies. According to them, the differences remained the same for PuSLI & PvSLI companies. As reported by Basu and Aithal [17], the performance of the private insurance players was unsatisfactory concerning earnings and financial health for ten years (2010 to 2020).

Based on the above literature review the following hypotheses were framed: We hypothesize that the Compound Annual Growth Rate (CAGR) of Investment of Public Sector Life Insurance Companies was statistically indifferent from PvSLI in India. We also set our hypothesis to insignificant differences between the CAGR of Investment Income of PuSLI & PvSLI companies in India. Additionally, we also hypothesized that no significant differences between the CAGR of Investment Yield of PuSLI & PvSLI companies occur in India. The LIC started working in 1956 as a Public Sector Life Insurance Company but the entry of the PvSLI companies became possible only after the recommendation of the Malhotra Committee in the year 2000. In India, the gross investment made by the insurance industry was ₹ 44 trillion during the 2021 financial year as compared to ₹ 39 trillion during 2020 [18].

2.1. Purpose of the Study

Investment funds of life insurance companies constitute a substantial amount; therefore, the growth and profitability of these funds cannot be ignored. It is evident from the literature review that many studies about the profitability of life insurance companies in India and overseas determined the effects of premium underwritten and claims settlement. Few researches were made on the profitability of investment in the insurance sector, but none has compared the growth pattern of investment yield of the two sectors. Therefore, it is imperative to analyze industrial growth in terms of the profitability of investment. Additionally, problems can be identified and resolved as these questions are further investigated. Based on the literature review three hypotheses have been framed. 1. Growth in Investment Funds of Public Sector and Private Sector Companies did not differ significantly over the last decade (2011-2021). 2. Growth in investment income of PuSLI and PvSLI companies was not significantly different. 3. Growth in investment yield of PuSLI and PvSLI companies did not differ significantly. The objectives of the present study were to analyze the investment growth and profitability position of the PuSLI & PvSLI companies in India over ten years (2011-2021) about investment.

3. Materials and Methods

3.1. Scope and Sample of the Study

The present study was focused on PuSLI & PvSLI companies operating in India until the end of March 31, 2021, when 24 life insurance companies were operating; one was in the public sector, whereas 23 companies were designated as private. The sample size was constituted of twenty-four life insurance companies, operating in India from their inception until March 31, 2021. However, a sample of all the companies for a period of 10 years (2011-2021) was considered for the present research.

3.2. Data Collection and Statistical Tools

The data was secondary and collected from the published annual reports of IRDA and LIC of India. If the Data was unavailable in the Annual Reports, then it was obtained from the Handbook of Indian Insurance Statistics published by the IRDA of India. Statistical analysis of the data was made by determining the range (minimum and maximum), mean, and standard deviations. The hypotheses were tested by determining T values and the significance of differences/ similarities was made at 5% confidence. For accurate application of the T-Test, equal and unequal variances were determined and F – Test was applied.

3.3. Variables and Their Measurements

3.3.1. Annual Growth Rate (AGR)

The AGR is an increased or decreased value of a variable over the previous year. The AGR is defined as follows. Annual Growth Rate (%) = [Current Year's Value / Previous Years' Value] X 100

3.3.2. Compound Annual Growth Rate (CAGR)

The CAGR is the average growth rate of a variable over a specific time that is greater than one year. The following mathematical formula was used to accurately calculate and determine returns of individual assets/investments that fluctuate in value over a period [19].

$$\text{CAGR} = (\text{VE} / \text{VB})^{1/t} - 1$$

(1) [VE = Value at the End; VB = Value at the Beginning; t = Time in Years]

3.3.3. Investment Yield

The investment yield is expressed as a percentage and defined as the income of investment returns over time such as interest received on holding a security. Investment Yield (%) = [Investment Income / Total Investment] X 100.

4. Results and Discussion

Table 1 shows the yearly growth of investment by both the sectors in terms of AGR and CAGR. To know whether the variance is equal or unequal, the F-Test was applied before the T-Test to test the hypotheses. Table 2 shows that the value of F (5.857996315) is greater than the Critical Value of F (3.178893104). Therefore, an unequal variance may be assumed.

Table 3 shows t Stat (-1.960563472) less than the t Critical Value of two tails (2.17881283). The calculated P value is 0.073560055 (P > 0.05). It is, therefore, due to the insignificant difference between CAGR of Investment of PuSLI companies and PvSLI companies in India the hypothesis was accepted at 5% confidence

Table 1. Investment by Life Insurance Companies in India

Year	(₹ in Crores)					
	LIC (Public Sector)			Private Sector		
	Investment	AGR (%)	CAGR	Investment	AGR (%)	CAGR
2010-11	1148589	***	***	281528	***	***
2011-12	1269070	10.49	0.1049	312188	10.89	0.1089
2012-13	1402991	10.55	0.1052	341902	9.52	0.1020
2013-14	1574296	12.21	0.1108	383169	12.07	0.1082
2014-15	1786312	13.37	0.1167	461210	20.37	0.1313
2015-16	2009119	12.47	0.1183	492949	6.88	0.1186
2016-17	2275277	13.25	0.1207	578917	17.44	0.1277
2017-18	2526923	11.06	0.1192	662137	14.37	0.1300
2018-19	2760658	9.25	0.1159	772485	16.67	0.1345
2019-20	3070852	11.24	0.1155	819422	6.08	0.1260
2020-21	3397832	10.65	0.1146	1082142	32.06	0.1441
Mean	2207333	11.45	0.1142	590652.1	14.64	0.1231
SD	724220.84	1.33	0.0055	245170.75	7.66	0.0134
MIN	1269070	9.25	0.1049	312188	6.08	0.1020
MAX	3397832	13.37	0.1207	1082142	32.06	0.1441

Table 2. F-Test Two-Sample for Variances

	Private Sector	Public Sector (LIC)
Mean	0.123131019	0.11417449
Variance	0.000178266	3.04313E-05
Observations	10	10
df	9	9
F	5.857996315	
P(F<=f) one-tail	0.007349054	
F Critical one-tail	3.178893104	

Table 3. T-Test Two-Sample Assuming Unequal Variance

	Public Sector (LIC)	Private Sector
Mean	0.11417449	0.123131019
Variance	3.04313E-05	0.000178266
Observations	10	10
Hypothesized Mean Difference	0	
df	12	
t Stat	-1.960563472	
P(T<=t) one-tail	0.036780028	
t Critical one-tail	1.782287556	
P(T<=t) two-tail	0.073560055	
t Critical two-tail	2.17881283	

Table 4 shows the average AGR of investment income of Life Insurance Corporation of India at 14.35 % as compared to PvSLI companies (640.58%). A huge difference between the average AGR of the public sector (LIC) and the PvSLI companies exists due to an extraordinary increase (6111.30%) in the AGR of investment income during the year 2020-21. However, the mean of the Compound AGR of LIC was higher (0.1476) as compared to PvSLI companies (0.0986) in India over ten years (2012-2021). The CAGR of Public Sector Life Insurance Company (LIC) was relatively constant as the standard deviation of the CAGR of LIC for the said period was ± 0.0093 , whereas it was higher (± 0.6695) in the case of PvSLI companies. Moreover, negative annual growths of 26.31% and 105.07% in the investment income of PvSLI companies were also observed in the years 2015-16 and 2019-20 respectively.

To know the variance whether it is equal or unequal, F-Test was applied before applying T-Test to test the hypotheses. Table 5 shows that the value of F (5167.145326) is greater than the Critical Value of F (3.178893104). Therefore, an unequal variance may be assumed.

Table 4. Investment Income by Life Insurance Companies in India

(₹ in Crore)						
	LIC (Public Sector)			Private Sector		
Year	Investment Income	AGR (%)	CAGR	Investment Income	AGR (%)	CAGR
2010-11	78797	***	***	8113	***	***
2011-12	91547	16.18	0.1618	11132	37.21	0.3721
2012-13	105318	15.04	0.1561	14655	31.64	0.3440
2013-14	118131	12.16	0.1445	19219	31.14	0.3331
2014-15	135516	14.72	0.1452	22064	14.8	0.2842
2015-16	158205	16.74	0.1496	16259	-26.31	0.1492
2016-17	192478	21.66	0.1605	69184	325.51	0.4293
2017-18	206070	7.06	0.1472	55754	-24.08	0.3170
2018-19	223642	8.52	0.1393	61158	9.69	0.2872
2019-20	236850	5.90	0.1301	-3105	-105.07	-1.8988
2020-21	297397	25.56	0.1420	186651	6111.30	0.3683
Mean	176515.4	14.35	0.1476	45297.1	640.58	0.0986
SD	62702.06	5.93	0.0093	52368.34	1826.65	0.6695
MIN	78797	5.9	0.1301	-3105	-105.07	-1.8988
MAX	297397	25.56	0.1618	186651	6111.30	0.4293

Table 5. F Test Two Sample for Variances

	Private Sector	Public Sector
Mean	0.098564575	0.147628544
Variance	0.497994623	9.63771E-05
Observations	10	10
df	9	9
F	5167.145326	
P(F<=f) one-tail	1.29054E-15	
F Critical one-tail	3.178893104	
F > F Critical (Therefore, Unequal Variance)		

Table 6 shows t Stat (0.219840816) less than t Critical two-tail value (2.262157163) and P Value (0.415450262), which is greater than 0.05. It was concluded that hypothesis 2 is valid and statistically acceptable. There was no significant difference between the CAGR of Investment Income of PuSLI and PvSLI companies in India over ten years (2011-2021).

Table 7 shows that the mean CAGR of Life Insurance Corporation of India is 0.0293 as compared to PvSLI companies (0.0219) in India. The average AGR of LIC of India during the period 2011-12 to 2020-21 was 1.916 whereas it was 490.75 in the case of private life insurers. The CAGR of LIC of India was constantly decreasing from 0.0510 in 2011-12 to 0.0256 in 2014-15; however, it rose to 0.0356 in the year 2016-17 but again started declining and reached the lowest to 0.0131 in 2019-20. The PvSLI companies have also shown a declining trend in CAGR two-tail value (2.262157163) and P Value (0.415450262), which is greater than 0.05. It was concluded that hypothesis 2 is valid and statistically acceptable. There was no significant difference between the CAGR of Investment Income of PuSLI and PvSLI companies in India over ten years (2011-2021). Table 7 shows that the mean CAGR of Life Insurance Corporation of India is 0.0293 as compared to PvSLI companies (0.0219) in India. The average AGR of LIC of India during the period 2011-12 to 2020-21 was 1.916 whereas it was 490.75 in the case of private life insurers. The CAGR of LIC of India was constantly decreasing from 0.0510 in 2011-12 to 0.0256 in 2014-15; however, it rose to 0.0356 in the year 2016-17 but again started declining and reached the lowest to 0.0131 in 2019-20. The PvSLI companies have also shown a declining trend in CAGR from 0.2396 in 2011-12 to 0.0270 in the year 2015-16 and reached a negative (1.7961) in 2019-20. Both the public and private sectors showed a maximum investment yield in the year 2016-17. It was 8.46% for LIC of India and 263.22% for PvSLI companies. The standard Deviation of the Investment Yield of Public Sector Companies was ± 0.39 whereas it was ± 5.02 in the case of PvSLI companies. It means a higher variation in the investment yield of PvSLI companies. Moreover, it can be seen from the table that the gap between the minimum and the maximum of SD is very high. The minimum Standard Deviation was (± 0.37) and the maximum of the same was ± 17.24 in the case of PvSLI companies. The investment Yield of Public Sector Companies did not fluctuate much over the study period. Moreover, the difference between the minimum (± 7.21) and the maximum (± 8.46) of SD is 1.25 only in the case of Public Sector Companies.

Table 6. T-Test Two-Sample Assuming Unequal Variances

	Public Sector	Private Sector
Mean	0.147628544	0.098564575
Variance	9.63771E-05	0.497994623
Observations	10	10
Hypothesized Mean Difference	0	
df	9	
t Stat	0.219840816	
P(T<=t) one-tail	0.415450262	
t Critical one-tail	1.833112933	
P(T<=t) two-tail	0.830900524	
t Critical two-tail	2.262157163	

Table 6. T-Test Two-Sample Assuming Unequal Variances

	Public Sector	Private Sector
Mean	0.147628544	0.098564575
Variance	9.63771E-05	0.497994623
Observations	10	10
Hypothesized Mean Difference	0	
df	9	
t Stat	0.219840816	
P(T<=t) one-tail	0.415450262	
t Critical one-tail	1.833112933	
P(T<=t) two-tail	0.830900524	
t Critical two-tail	2.262157163	

Table 7. Investment Yield by Life Insurance Companies in India

Year	Public Sector (LIC)			Private Sector		
	Investment Yield (%)	AGR (%)	CAGR	Investment Yield (%)	AGR (%)	CAGR
2010-11	6.86	***	***	2.88	***	***
2011-12	7.21	5.10	0.0510	3.57	23.95	0.2396
2012-13	7.50	4.02	0.0456	4.21	17.92	0.2091
2013-14	7.50	0.00	0.0302	5.01	19	0.2027
2014-15	7.59	1.20	0.0256	4.78	-4.59	0.1350
2015-16	7.87	3.82	0.0279	3.29	-31.17	0.0270
2016-17	8.46	7.49	0.0356	11.95	263.22	0.2676
2017-18	8.15	-3.66	0.0249	8.42	-29.53	0.1656
2018-19	8.10	-0.61	0.0210	7.91	-6.05	0.1346
2019-20	7.71	-4.81	0.0131	-0.37	-104.68	-1.7961
2020-21	8.22	6.61	0.0183	17.24	4759.46	0.1960
Mean	7.831	1.916	0.0293	6.60	490.75	-0.0219
SD	0.39	4.19	0.0119	5.02	1502.87	0.6270
MIN	7.21	-4.81	0.0131	-0.37	-104.68	-1.7961
MAX	8.46	7.49	0.0510	17.24	4759.46	0.2676

To apply the correct T-Test, it is essential to know the variance, whether there is an equal variance or unequal variance, hence F-Test was used. Table 8 shows that calculated value of F is 2791.550266 which is greater than the tabulated value of F (3.178893104). It is, therefore, concluded that there is an unequal variance. Hence, the T-Test should be used with an unequal variance.

Table 8. F-Test Two-Sample for Variances

	Private Sector	Public Sector
Mean	-0.021896395	0.029304039
Variance	0.393108753	0.000140821
Observations	10	10
df	9	9
F	2791.550266	
P(F<=f) one-tail	2.05859E-14	
F Critical one-tail	3.178893104	

Table 9 shows that t Stat (0.258190058) is less than t Critical two-tail value (2.262157163) and P Value (0.80206749) is greater than 0.05. It is therefore, hypothesis 3 may be accepted. CAGR of the Investment Yield of PvSLI companies and that of PuSLI companies did not differ significantly.

Table 9. T-Test: Two-Sample Assuming Unequal Variance

	Public Sector	Private Sector
Mean	0.029304039	-0.02189639
Variance	0.000140821	0.393108753
Observations	10	10
Hypothesized Mean Difference	0	
df	9	
t Stat	0.258190058	
P(T<=t) one-tail	0.401033745	
t Critical one-tail	1.833112933	
P(T<=t) two-tail	0.80206749	
t Critical two-tail	2.262157163	

5. Conclusions

Life Insurance companies undertake the responsibility of compensating the monetary loss of policyholders in return for a sum of money received from them. Money paid by policyholders for such protection is called insurance premiums. Premiums paid by many policyholders will surely form a huge sum of money deposited with the insurers. Policyholders should be vigilant to see whether the money collected by these life insurers is properly invested in profitable and safe projects or not. Before the year 2000, there was only one life insurance company in India, and that too in the public sector. However, after the privatization of the insurance sector in India, many private insurers came onto the scene. Life Insurance was nationalized in the year 1956 to provide the safety of public funds but it was again privatized in 2000. The primary objective of the public sector life insurance company (LIC) was therefore to ensure the safety of funds. It is, therefore, necessary to see the safety of funds after the advent of private sector companies in the field. A policyholder must see the growth of these companies and compare the performance of both the sectors. A very strong parameter for growth is considered the profitability of investment. This paper, therefore, has analyzed and compared the growth and profitability of investment of life insurance funds of the two sectors to judge their long-term sustainability. A policyholder can rely much upon those insurers who have performed comparatively better in these parameters than others

For the study, growth in investment, growth in income from investment, and growth in investment yield of the companies of the two sectors were compared. Annual Growth of Investment by LIC of India over the study period was without much fluctuation because the AGR was minimum (9.25%) in 2018-19 and maximum (13.37%) in 2014-15. However, a high fluctuation in this growth can be observed in the case of PvSLI companies. The minimum AGR of the PvSLI companies was 6.08% in 2019-20 and the maximum was 32.06% in 2020-21. The LIC of India has shown smooth growth in its investment against private sector life insurers over a decade (2011-2021).

Our hypothesis was valid and proven since there was no significant difference in the growth of investments made by the PuSLI and PvSLI companies. The LIC has never suffered a loss in its investment income during the study period, but PvSLI companies faced losses in their investment income in 2019-20. The annual growth of the Investment Income of private life insurers showed a greater fluctuation as compared to PuSLI Companies. A high fluctuation in the AGR of investment by PvSLI companies can be determined based on the SD which was ± 7.6 (Table 1) as compared to ± 1.33 of the Public Sector Companies. It is concluded that AGR in investment by PuSLI was almost constant. The AGR in the investment income of PvSLI companies also showed tremendous fluctuation year after year. The least annual growth of such income was (-105.07%), whereas the highest was 6111.3% of PvSLI companies.

The Public Sector Life Insurance Company shows smooth growth in the investment income as the SD was ± 5.93 only. Individual figures for both the sectors show the differences in terms of Growth in Investment and Investment Income but they could not be proved statistically. The PvSLI companies must take negative growth in the investment income in the year 2019-20 seriously and they must try to find out the real causes of decline. A part of the profit earned by the life insurers is distributed to the policyholders as a bonus, therefore, the policyholders are interested in knowing the profitability of investment of these companies. Consequently, profitability ensures growth and stability in the market. Life Insurance companies should carefully invest their funds to generate profit and it is also important at the same time not to lose the safety of their investments. It is also suggested that PvSLI should invest in less volatile securities to avoid higher risk of safety of funds and ensure the smooth and growth in investment yield. The study particularly pertains to the companies operating in India but the results and suggestions can be helpful for the life insurance companies operating in other countries as well. This research paper has taken the Investment Amount, Investment Income, and Investment Yield as the variables to study the growth and profitability of Investment. Other dimensions such as the security and safety of investment funds can be considered for further research. Moreover, liquidity and profitability of investment can also be compared between the two sectors for further study.

Appendix

Names of 24 Life Insurance Companies operating in India by the end of March 31, 2021.

1. Life Insurance Corporation of India (Public Sector)
2. Max Life Insurance Co. Ltd
3. HDFC Life Insurance Company Co. Ltd
4. ICICI Prudential Life Insurance Co. Ltd
5. Kotak Mahindra Life Insurance Co. Ltd
6. Aditya Birla Sunlife Insurance Co. Ltd
7. TATA AIA Life Insurance Co. Ltd
8. SBI Life Insurance Co. Ltd
9. Bajaj Allianz Life Insurance Co. Ltd
10. MetLife India Insurance Co. Ltd
11. Reliance Nippon Life Insurance Co. Ltd
12. Avia Life Insurance Company India Co. Ltd.
13. Sahara India Life Insurance Co. Ltd
14. Shriram Life Insurance Co. Ltd
15. Bharti AXA Life Insurance Co. Ltd

16. Future Generali India Life Insurance Co. Ltd
17. Ageas Federal Life Insurance Co. Ltd
18. Canara HSBC Life Insurance Co. Ltd
19. Aegon Life Insurance Co. Ltd
20. Pramerica Life Insurance Co. Ltd
21. Star Union Dai-Ichi Life Insurance Co. Ltd
22. IndiaFirst Life Insurance Co. Ltd
23. Edelweiss Tokio Life Insurance Co. Ltd
24. Excide Life Insurance Co. Ltd

Source: IRDA

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REFERENCES

- [1] Feyen E., Lester R., Rocha R., "What Drives the Development of the Insurance Sector? An Empirical Analysis based on a Panel of Developed and Developing Countries," *Policy Research Working Paper, World Bank Group*, <https://doi.org/10.1596/1813-9450-5572>
- [2] Indian Brand Equity Foundation, "Indian Insurance Industry Overview and Market Development Analysis," <http://www.Ibef.org>.
- [3] Banerjee S., Savitha B., "Competition reduces profitability: the case of the Indian life microinsurance industry" *Geneva Papers on Risk Insurance - Issues and Practices*, vol. 46, pp. 383–398, 2021. DOI: 10.1057/s41288-020-00203-5
- [4] Charumathi B., "On the Determinants of Profitability of Indian Life Insurers – An Empirical Study", *Proceedings of the World Congress on Engineering*, (London, U.K.), July 4-6, 2012. URL: https://www.iaeng.org/publication/WCE2012/WCE2012_pp505-510.pdf
- [5] Gavrillo T., Melnychuk O., "Features of Investment Activities of Insurance Companies in Ukraine," *Market Infrastructure*, URL: <https://ouci.dntb.gov.ua/en/works/4kx yaE6l/>
- [6] Dadhich M., "Introduction to Investment and Insurance Industry," in *An Empirical Study of Investment Pattern of Indian Insurance Companies: A Case Study of Public and Private Insurance Companies*, 1st Ed, BR, 2022, pp. 1-146.
- [7] McCahan, D., "Investment of Life Insurance Funds," in *University of Pennsylvania Press*, 1st ed., JSTOR, 1953, pp. 1-320.
- [8] Nagalaxmi N., Mathiraj S. P., "Growth and Performance of Public and Private Life Insurance Sector," *Journal of Emerging Technology and Innovative Research*, vol. 6, no. 4, pp. 245-254, 2019. URL: <http://www.jetir.org/papers/JE TIR1904E42.pdf>
- [9] Verma A., Bala R., "Growth on Life Insurance Sector in Pre and Post Liberalization in India," *Conference on Emerging Horizons in Business Management*, (Haryana, India), 2015. URL: <https://www.researchgate.net/publication/290438725>
- [10] Devanand H. N., Prasad R. T., "Performance of Life Insurance Business in the Post Crisis Period," *Shanlax International Journal of Economics*, vol. 3, no. 4, pp. 5-16, 2019. URL: <http://www.shanlaxjournals.in/journals/index.php/economics/article/view/1485>
- [11] Parida, T.K., Acharya, D., "Life Insurance in India: Efficiency and Profitability," in *the Life*

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- Insurance Industry in India*, PM, 2017, pp. 73-79. DOI:10.1007/978-981-10-2 233-3_3
- [12] Nikita S., “Determinants of Insurance Investment: A Case Study of Life Insurance Corporation of India,” *ELK Asia Pacific Journal of Finance and Risk Management*, vol. 6, no. 3, pp. 73-86, 2015. DOI: 10.16962/EAPJFRM/6_3_6.
- [13] Adams M., “Investment Earnings and the Characteristics of Life Insurance Firms: New Zealand Evidence,” *Australian Journal of Management*, vol. 21, no. 1, pp. 41 – 55, 1996. DOI: 10.1177/031289629602100106
- [14] Chen B. Y., Hamwi I. S., “Performance Analyses of U.S. Property-Liability Reinsurance Companies,” *Journal of Insurance Issues*, vol. 23, no. 2, pp. 140–152, 2000. <http://www.jstor.org/stable/41946186>.
- [15] Husain S., “Comparative Analysis of Profitability Position between Public and Private Sector Life Insurance Companies in India,” *Journal of Business and Economic Policy*, vol. 9, no. 4, pp. 10-17, 2022. DOI: 10.30845/jbep.v9n4p2
- [16] Kumar R., Singh S., “A Comparative Analysis of Private Insurance Companies and Life Insurance Corporation of India,” *Sachetas*, vol. 2, no. 1, pp. 27-37, 2023, DOI: 10.55955/210004.
- [17] Basu T., Aithal P. S., “Financial Growth Assessment of Private Life Insurers in India: An Aggregative Study,” *Revista Review Index Journal of Multidisciplinary*, vol. 2, no. 3, pp. 06-13, 2022, DOI: 10.31305/rrijm2022.v02.n03.002.
- [18] Rathore M., “Life Insurance Investment India FY 2017-2022, by Sector” <https://www.statista.com>.
- [19] Wayman R., “Compound Annual Growth Rate: What You Should Know,” Online available from <http://investopedia.com>

Regulatory Constraints on Financial Performance of Insurance Firms in Egypt: Structural Equation Model

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ABSTRACT

The structural equation model is used to examine the relationship between regulatory constraints measured by investment to paid capital, cash to paid capital, government securities and certificate, and firm size (algorithm of total assets) on financial performance measured by liquidity, Return on equity and Return on assets of insurance industry in Egypt. The results showed that the relationship between regulatory constraints and return on equity is such that there is a significant negative effect of the construct the independent variables in terms of investment, cash, and government securities and secure certificates (X3), on the dependent proxy, return on equity. However, the later independent proxy of the algorithm of total assets (lnx4) has a positive impact on the dependent proxy in terms of return on equity and a significant negative impact of the independent proxies' investment, and cash on the dependent variables return on assets. However, the later independent variable of the algorithm of total assets (lnx4) has a positive effect on the dependent variable of return on assets. This validates the second research hypothesis, as the independent variables investment, cash, and algorithm of total assets (lnx4) have a significant effect on the dependent variable return on assets. Beside that there is a significant negative effect of the independent variables investment X1, and cash X2 on the dependent variable liquidity. However, the later independent variable of (lnx4) has a positive effect on the dependent variable liquidity. This validates the third research hypothesis, as the independent variables investment, cash, and algorithm of total assets have a significant effect on the dependent variable liquidity, but an insignificant relationship with government securities.

Keywords Regulatory Constraints Operating Objective (Profitability), Operating Policy (Liquidity)

1. INTRODUCTION

The insurance industry, as a financial intermediary, is very important to Egyptian economy, so, it is heavily regulated to provide efficient service and protection against financial risks. The Egyptian Financial Supervisory Authority issued bylaw (No.10) for the year 1981, amendment in 2008, to mitigate the risk of insurance sector in paid capital requirements raised up from 60M to 100M Egyptian pounds. The literature review has shown the effect of regulatory constraints of insurance industry on their performance, and products pricing, for instance **Martin F. Grace & Richard D. Phillips** [1] showed the levels of regulations in insurance sector, while for Mathew L. Higgins & Paul Thistle [2] tested the regulatory constraints on product pricing in insurance firms. Also **L. Nguyen & A. C. Worthington** [3] tested the industry regulation and efficiency. As for **Pablo G conzalez & Lars F. Anderson** [4] used a novel dataset to investigate financial constraints on capacity in Spanish insurance firms.

Though the regulatory constraints play a critical restricting role in insurance industry diversification portfolio, they are perceived as regulations for how insurance firms allocate and invest their funds, especially the Capital structure which has special importance, as a clause (28) of the Egyptian Law

identifies. So, the main question is whether the regulatory constraints have improved resources allocation in insurance industry in Egypt whereas the financial supervisory authority has increased paid up to (100M) Egyptian pounds although the sum of total assets for one company from 39 companies in Egypt like MISR Insurance Company is more than (10B). Nevertheless the ratios are still as the following:

In terms of the ratio of share, it is 10% to paid capital. Regarding to the bonds ratio, it is 10% to paid capital. While the investment in Real Estate ratio is 10% to paid capital; whereas the grants differences to guarantee commercial mortgages ratio is 10% to paid capital.

Although insurance firms have faced numerous challenges in the last decade, they are still required to maintain certain financial ratios. For instance, as per the regulations issued in 1981, the cash ratio should be at least 50% to paid-up capital, and the investment approved by the regulator ratio should be 10% of the paid-up capital. Additionally, firms must hold government securities and secure certificates to at least 25% of the paid-up capital.

This study draws on the impact of the financial constraints as government regulations on operating objectives (profitability) and corporate policy (liquidity). Although there is a lot of researches on this area, however in Egypt it is focused on banking sector, as Nader Abler & Hatem Ramadan [5] revealed the significant relationship between applying regulations and banking stability and banking efficiency, while Lukas Ahnert et al [6] measured banks performance in US and Europe by return on equity, return on assets and liquidity, which are consistent with the current paper.

Due to the importance of the insurance sector in Egypt, and lack of researches in this area, this study was carried out to highlight and draw attention to the role of the financial regulations on the financial performance.

2. Literature Review

A. Insurance

According to Martin F. **Grace & Richard D. Phillips [1]**, this article presented evidence of insurance demotic firms which have a great level of regulations and achieved a high level of profitability, but some of the small domestic insurance firms have less profitability than the others. Mathew L. Higgins & Paul Thistle [2] said the empirical results indicate the capacity constraint regarding premium surplus ratio impact on underwriting profit, but the relationship is nonlinear and dynamic profit has a negative relationship with the value of derivatives of property liability insurance firms. Shan Ge [7] tested the relationship between the financial constraints on product pricing in life insurance industry; the results concluded that life insurance prices change drastically in different directions with different scenarios and decisions, and the financial constraints and change in prices are greater. Moreover, this study highlighted that the insurance plays a significant role in the market as financial intermediation. Minhua Yang [8] by using ordinary least square analysis, he investigated the relationship between financial innovation regulation and financial performance in listed China firms; the result shows the financial regulations have a negative effect on financial performance. **L. Nguyen & A. C. Worthington [3]** used data development analysis to examine the relationship between the industry regulation and efficiency, the result shows the regulations and size affected the efficiency of Australian private insurer. **Pablo Gonzalez & Lars F. Andersson [4]** used novel dataset to investigate financial constraints on capacity in Spanish insurance firms, they found that the foreign insurance affected capacity of insurance firms, also

B. Banking

Swamy V. [9] presented a model for relationship associated between the regulations and bank profitability of Indian banks; he concluded that an increase of one percent in capital ratio to risk weighted assets affected the interest income by 17 percent, and that means the relationship between the regulations with the profitability, which measured by Return on equity is positive. Harald Benink et al [10] studied the role of regulatory constraints in terms of Basel II according to the analysis of this role by using risk model; he revealed that this role has a direct effect on propensity for endogenous risk, and increased financial stability. **Lukas Ahnert et al [6]** investigated the financial regulations on US and European banks performance, the results indicated that the passing banks have positive significant abnormal equity returns of 58-52 points, but failing banks have negative abnormal (174) banks point release positive performance. Yishu Fu et al [11] by using disequilibrium equation model to test capital regulations on bank behavior, the results showed that the regulatory constraints have a significant and positive relationship with bank behavior and well capitalized bank, but the relationship with capital level is negative and significant in China. **Clifford A. Ball & Hans R Stoll [12]** using operator training simulator model to evaluate the capital regulations requirements, they documented the regulatory constraints requirements distort the investment decision, and it is adversely affected in incentive investment in US banks. **Ansgar Walther [13]** to answer the question about how to achieve efficiency in banks, the study analyzed the relationship between banks regulations and liquidity; it revealed that the efficiency can be achieved through establishing simple banks regulations, and can change systematic risk when implementing optimal policy with constraints in capital requirements adequacy. Eric Monnet & Miklos Vari [14] in terms of liquidity constraints they are used as tools to maintain low interest rate in banks to reduce borrowing that increase ability to purchase government securities, and this achieves the purpose of monetary policy. Nader Alber & Hatem Ramadan [5] to test the association of the impact of banking regulations with bank performance in MENA region, this paper conclusions indicated a significant impact of financial regulatory on banking performance in terms of profitability, banking efficiency and bank stability; moreover there is a significant impact of banking regulations on liquidity requirement provision policy, but there is a negative impact of non-performing loans and leverage requirements. Prachi Mishra & Ariel Reshef [15] investigated the effect of central bank governor in financial regulations, and the results showed that 20% form the research sample have a relationship with greater financial reform.

C. Other

This part reviews the previous studies which addressed the financial constraints on financial performance in different sectors: **Karas, M., & Režňáková, M. [16]** sought to analyze the impact of financial constraints on financial variables in predicting small and medium-sized enterprises through using Cox semi-parametric model. The results show that incorporating financial constraints variables help in predicting default. **X. Chang et al [17]** investigated the financial constraints in their paper on Australia firms, and their captured results indicated that the financial constraints minimize the sensitivity of investment to internal resources, and increase the cash in hand to internally gains funds by using regression. According to Xiang **Zhang et al [18]**, the study result showed that the relationship between business development and cash holdings is negative, besides, the financial constraint mitigated the impact of institutional development. **Aaron lane [19]** conducted a study to use a structural model to test the relationship between regulatory constraint and innovation, and whether regulatory constraints are constraining innovation. Guohua Cao et al [20] examined the financial constraints and short selling with corporate fraud in China corporations; however, the short selling

[21] documented that the relationship between the financial constraint and volatility of cash was a positive relationship; based on that result the paper recommended the increase the financial constraint. Siddarth Roche et al [22], concluded that the financial constraints reduce process innovations, so they recommended the mitigation of the financial constraints. Whereas the control variable (size of the firm) has a positive impact on process innovation in Australian firms. Getaneh M. Ayele [23] used panel regression model to examine the effect of the financial constraints (capital adequacy and legal reserve) with risk-taking in Ethiopia private banking sector, the conclusions refer to a positive relationship between capital adequacy and risk taking. However, there are different results in two periods: in the first, the relationship was negative with liquidity, and in second one it was a positive relationship. For Xin Chang et al [24], the regression model results of this paper showed the net cash working capital is significant, and a positive relationship with short term debt, the financial constraint has a little impact on firm investment, but the severity financial constraint is negative with cash flow in Australians corporate. Ralston, D. [25] based on results of the model that developed in this paper, the regulatory reform has a significant effect on the allocation efficiency of both credit union stability and samples investigated in the portfolio performance in Australian firms also the regulatory reform has a potential allocation of efficiency in portfolio. Sasan Bakhtiari et al [26] investigated the role of the regulatory constraint on small medium enterprises to find its effect on growth business cycle and credit access in the Organization for Economic Co-operation and Development countries (OECD). Margaret J. Greenwood & Lei Tao [27] put forward that the costly regulatory intervention affected financial reporting quality, but agency theory increased financial reporting quality, according to the study. Annalisa Ferrando & Alessandro Ruggieri [28] presented the relationship between financial constraints with productivity in Euro companies; the findings referred to a negative significant relationship between them in small medium enterprise. Ulf Von Kalckreuth [26] conducted in UK manufactures to test the relationship between financial constraints and capacity restrictions, the study results indicated that the financial constraints have an effect on closed capacity gap, also for small companies closed capacity gap is faster than other large companies. Thomas S. Y. et al [30], the topic of this article was to identify whether the regulatory constraints improved real allocations resources; it concluded that the regulatory constraints system succeeded in limiting system fragility and reducing the capital requirements. The important result in this paper determines the optimal size of the financial sector, using macro dynamic model. Ornella **W. Matetta & Vania Sena [31]** used the efficiency frontier to analyze the relationship between financial constraints and technical efficiency, they revealed that the regulatory constraints had a positive impact on technical efficiency in Italian producer cooperatives. **Michael Machokoto & Geofry Areneke [32]** used panel data analysis revealing that the financial constraints affected negatively the investment cash flow, however the credit constraint has a significant effect on changes in capital market. **Annick Pamen Nyola et al [33]** investigated the impact of regulation on European banks by dividing the sample into three categories: high income, middle income and low income. The findings indicate that the regulations have a positive, significant relationship with the high income level. However in the middle and low income categories, the activities decrease and entry requirements are affected. Aviner Augusto S. Manoel et al [34] investigated the relationship between the financial constraints on market value of Brazilian firms. The findings indicate that the financial constraint significantly affects market value but non constraints have little effect on the cash flow held by companies. **Ofoeda, I. et al [35]** conducted a study to test the impact of the regulatory constraints, financial inclusion with growth of economic in (52) African countries. They found that the financial inclusion and regulation have a strong and significant effect on economic growth using a regression model. **Georgios Efthymoulou & Prit Vahter [36]** used a Univariate Probit model to analyze the associated financial constraints on innovations performance. They indicate that a significant positive impact of the financial constraints with performance of

dividends. Otherwise, the company would face the risk of receivership or liquidation. The relationship between cash and debt is, therefore, negative. The research of Yogesh and Vigneswara (2017) confirms this negative relationship by demonstrating that firms whose main source of financing is debt are less confronted with agency costs. From what has been advanced, we can make the following assumption: H.2 "Corporate indebtedness has a negative impact on the level of liquid asset holdings".

Dividends

The payment of dividends indirectly avoids the problems of opportunistic behavior of managers (Easterbrook, 1984; Jensen, 1986). This is because the distribution of profits will force company managers to turn to bank loans to finance new investments, and thus submit to the pressure and constraint of the financial market. So we can make the following assumption: H.3 "Dividend distribution has a negative impact on the level of holdings of liquid assets".

Cash flow

According to agency theory (Jensen, 1986), the higher the firm's cash flow, the greater the agency costs between management and shareholders will be. The manager seeking his interest will see this as an opportunity to maximize the liquid assets at their disposal rather than using them optimally. The relationship between the cash and cash flow would then be positive. Therefore, we can advance the following hypothesis: H.4 "Cash flow has a positive impact on the level of liquid asset holdings".

Growth opportunities

According to agency theory, firms with limited growth opportunities are more exposed to discretionary management risk, since in the absence of sufficient growth and investment opportunities, managers are more likely to accumulate the most liquidity to benefit from their discretionary power (Opler et al., 1999), and to then reinvest them in unprofitable projects related to their career and experience, fostering their entrenchment (Ferreira & Vilela, 2004; Afza & Adnan, 2007). Several empirical studies document a significantly negative relationship between growth opportunities and cash holdings (Afza & Adnan, 2007; Baklouti & Bouri, 2015; Yogesh & Vigneswara, 2017). Growth opportunities are measured by Tobin's Q ratio calculated by dividing the market value of equity (Market Capitalization) plus the value of net financial debt over the net book value of the firm's assets (Book Value). Since netbook assets do not consider the presence of growth opportunities, Tobin's Q will be high for companies with growth opportunities. Therefore, we can assert the following hypothesis: H.5 "Growth opportunities are negatively correlated with cash holdings".

Financial distress

As several authors explain, firms in financial distress suffer from lower agency costs because of the disciplinary role of financial pressure on managers who find themselves forced to make optimal use of the available funds at their disposal, fearing the risk of bankruptcy of the firm (Kim et al., 1998; Drobetz & Grüninger, 2007). The relationship between financial distress and liquidity would then be negative. Thus, hypothesis H.6 can be established as follows: "Financial distress has a negative impact on the level of ownership of liquid assets".

Larger shareholder

The control of managers is essential in reducing agency conflicts between shareholders and managers. However, for a minority shareholder, the cost of supervision is greater than the benefit it can derive from it, so it is not in their interest to effectively control the managers. On the other hand, the benefits that a major shareholder derives from the supervision of managers exceed the costs it incurs, and therefore it

of innovation. **Daniel Paravisini [37]** tested the financial constraints on firms' access to external resources using novel data analysis of local bank in France. This paper conducted that when the lending expands the profitability of bank portfolio in terms of lending does not decline, and total deposit increases. **Pablo G. G. Alez & Lars-F. Andersson [38]** applied the fire insurance in Spain to test the regulatory constraints on capitalization and capacity. The findings indicate that foreign reinsurers increasing capacity, and financial leverage has a positively significant relationship with reinsurance when loss ratio is significant with reinsurance but weakly correlated. Fernando R. Chaddad & Jeffrey J. Reuer [39] analyzed the associated the financial constraints on initial public offerings in US firms by dividing the study period into three periods and using econometric methodology. The findings indicate that in the first period there is no change in investment and cash flow; in the second there was a negative effect of financial constraints on cash flow and investment; and in third period, there was a decline in cash flow and investment. **Priya Nagarai & Chuanqian Zhang [40]** assessed the relationship between regulatory quality on cost of capital and equity by using multilevel mixed models. The conclusion indicates a negative relationship between the regulatory quality with cost of capital when applied in (55) countries over (13) years. **Timothy J. Riddiough & Zhonghua Wu [41]** investigated the associated investment and liquidity management with the cash constraint firms. They revealed that there is a smooth variation in cash flow with investment and financial constraints pushing the firms more sensitive towards cash constraints in firms listed in NYSE and NSDAQ. **Pateris Zilgalvis [42]** tested the regulatory effect on the financial innovation principle to determine prioritizing regulatory. The article revealed the most important result is regulatory protecting the investors from the fraud loss and risk and providing investors with information. **Weixi Liu & Ian Tonks [43]** analyzed the relationship between pension funding constraints and firms costs using GMM system. The findings suggest a negative association of pension funding constraints with firm dividends, the associated funding requirements with investment are sensitive in UK pension funding. Pargati Priya & Chandan Sharma [44] applied in (74) developing countries to investigate the relationship between the financial constraints and corruption and innovation capacity. The conclusions indicate that the financial constraints have an adverse effect on innovations capacity, and the relationship between financial constraints is positive with corruptions in developing countries. Nina Budina et al [45] tested liquidity constraints on investment performance using accelerators model in Bulgaria firms. The findings indicate that there is no association between the cash flow and investment, and liquidity constraints have a positive relationship with firm size but a negative relationship with debt. **Ali Gungoraydinoglu & Özde Öztekin [46]** examined the financial crises and banking regulations on corporate financing. The study findings show that there is a significant impact of financial crises on financial decision-making. Financial crises pushed the corporate corporations to depend on leverage, and the firms have difficulty issuing securities during the financial crises. This study used a multivariate regression model.

3. Methodology, Variable Definitions and Data Resources

Salah Eladly [47] used the structural equation model to test the multivariable relationships in risk performance on working capital management. The conceptual framework was investigated using AMOS23 and the Multivariate Detection model, which was also used by Ali Gungoraydinoglu & Özde Öztekin [46], to analyze the relationship between multiple variables. For this study, data was collected from Egyptian Financial Supervisory Authority reports of financial position (balance sheet and income statements) for insurance firms under the financial authority form 1999 to 2019. Dependent variables were selected from the annual reports, as shown during the sample period: (Y1) Return on equity (ROE), which was measured by dividing net operating profit by equity; (Y2) Return on assets (ROA), measured by dividing net operating profit by total assets; and (Y3) Liquidity, which was measured by

by dividing net operating profit by total assets; and (Y3) Liquidity, which was measured by Minhua Yang [8] using ROE and ROA, and by Nader Alber & Hatem Ramadan [5] to measure banking performance. The Control variable was calculated based on total asset algorithm, which is a natural algorithm of total assets. The Independent variables were selected according to Law NO. 10. As noted by Annalisa Ferrando & Alessandro Ruggieri [28], which used investment constraints. This study used most of investment variables treated in Law 10 as mentioned before. Ulf Von Kalckreuth [29] measured financial constraints by investment restrictions and the firm size as control variable, consistent with this paper. The cash ratio to paid capital was 50%, and the ratio of bonds to paid capital was 10%. In terms of government securities and secure certificates ratio to paid capital was 10%, and the last variable in regulatory constraints was other approved investments by the regulator ratio to paid capital, which was 10%. This study concurs with Pablo G. G. & Lars-F. Andersson [38] in the applied filed of insurance to test the effect of regulatory constraints. Furthermore, this study was consistent with Nina Budina et al [45] to test liquidity constraints on investment, where the current study used liquidity as a proxy of financial performance as dependent variable. Ansgar Walther [13] studied the relationship among banks regulations and liquidity in this research. Based on the previous literature review this paper has selected the following independent variables:

Based on the previous literature review this paper has selected the following independent variables:

- (1) Investment to paid capital (X1), this ratio has been selected to express the percentage in the same ratio (10%). The second reason for selecting the investment ratio is that it expresses the proportion of bonds and shares. Cash to paid capital (X2).
- (2) Government securities and secure certificate (X3).
- (3) Algorithm of total assets (X4).

4. Hypotheses and Objectives

- (1) Regulatory constraints are positively associated with return on equity in Egyptian insurance firms.
- (2) Regulatory constraints are positively associated with return on asset in Egyptian insurance firms.
- (3) Regulatory constraints are positively associated with liquidity in Egyptian insurance firms.

Objectives:

- (1) To investigate the impact of the regulatory constraints on financial performance of insurance companies in Egypt.
- (2) To mitigate the effect of the regulatory constraints on investment channels and instruments for high level of profitability (if there).
- (3) Possibility to modify the ratios of investment instruments.

5. Empirical Results and Discussion

A. Summary of descriptive analysis

The following table 1 reports the basic descriptive analysis of the financial performance variables liquidity, ROE and ROA with regulatory constraints variables investment, cash and government securities, and secure certificate as independent variables. This paper used a sample of (23) firms for (21) years for (399) observations which have supervision under Financial Authority in Egypt. Table 1 reports the descriptive analysis where row-1 mean, row-2 median, row- 3 max, row-4 min. row-5 standard division, row-6 skewness row-7 Jarque- Bera and probability.

Table 1 shows the size and liquidity have been represented statically with a significant impact on financial performance. This study is consistent with Salah Eladly [47] and **Jing Ai Vickie Bajtelsmit**

Tianyang Wang [48] both of whom showed a statistically significant relationship between the firm size with financial performance. But the negative relationship has been noticed in literature review, for example X. Chang et al [17] used a sample of (420) Australian firms to investigate the financial constraints on Australia's firms' performance, they captured the results that the financial constraints minimize the sensitivity of investment to internal resources and beside increase cash in hand to internally gains funds by using a regression model.

Table 1. Descriptive statistics for regulatory constraints with financial performance during the period study

tests	Investment	Cash	Shares	Ln _{x4}	ROE	ROA	Liquidity
Mean	0.017060	0.089519	0.043259	13.17006	0.138785	0.030481	0.844375
Median	0.015340	0.071977	0.038488	13.09981	0.139345	0.028420	0.851430
Maximum	0.044395	0.239380	0.114690	16.62014	0.474458	0.096811	0.997488
Minimum	0.000261	0.001307	0.000654	9.472166	-0.220321	-0.034591	0.595981
Std. Dev.	0.011564	0.059884	0.029442	1.507681	0.141172	0.024850	0.086929
Skewness	0.383055	0.313761	0.389552	0.240858	0.082026	0.208380	-0.440053
Kurtosis	2.236610	2.429707	2.229707	2.658386	2.899317	2.836910	2.877177
Jarque-Bera	19.44605	17.95589	19.95589	5.797972	0.615960	3.329772	13.12830
Probability	0.001***	0.001***	0.001***	0.055079	0.734930	0.189212	0.001410**
Observations	399	399	399	399	399	399	399

*** α Less than (0.001). ** α residual less than (0.01).

B. Univariate detection

Shan Ge [7] used Univariate analysis to test the relationship between financial constraints and product prices in life insurance; also Salah Eladly [47] used Univariate detection to analyze the relationship between risk performance and working capital management in insurance firms. However, both of them used this test to identify the presence of some outliers and extremes for each variable separately, omitted those outliers by using Box-and-Whisker Plots test for computing the values of both the lower quartile Q1 and the upper quartile Q3, then calculating the interquartile range $IQR = Q3 - Q1$, and finally excluding the values less than $(Q1 - 1.5IQR)$ and those higher than $(Q3 + 1.5IQR)$ to replace missing values by using linear interpolation and complete these missing values by using the transform command.

C. Multivariate detection

This paper used multivariate analyses, which include two variables and more. For instance Ali Gungoraydinoglu & Özde Öztekin [46] used a multivariate model to test multidimensional variables, so this paper requires a means to objectively measure the multidimensional position of each observation relative to some common point. This version is addressed by the Mahalanobis D2 measure, a multivariate evaluation of each observation across a multivariable. This approach measures each observation's distance in multidimensional space from the mean center of all observations, to provide a single value for each observation irrespective of the number of variables considered, and can remove observations in this multidimensional when higher D2 values represent observations farther removed from the general distribution.

The findings shown in the above Table 1, can be concluded that the normality distribution of this study proxies in terms of algorithm of total assets (ln_{x4}), return on equity (Y1), and return on assets (Y2) the Jarque-Bera used to test at a significant level $\geq (0.05)$. On the other side, this paper variables investment X1, cash X2, government securities and secure certificate X3, and liquidity Y3 have not normally

distributed, since the significance of Jarque-Bera statistic is $\leq(0.05)$. But when the coefficient of the Pearson skewness is less than or equal (1) or greater than or equal to (-1), as shown on the above table 1, the data are not significantly skewed based on the review of literature findings, which refer to a positive relationship between regularity constraints and financial performance as for Nader Alber & Hatem Ramadan [5], Lukas Ahnert et al [6] and Swamy V. [9] in contrast to this study's finding that the negative relationship between regulatory constraints and financial performance is consistent with Mathew L. Higgins & Paul Thistle [2].

D. Testing of Group unit root

In this section, a set of tests were used as shown in the following table 2 to assure that variance and mean are invariant: the unit root test to investigate over the period 1999 to 2019, the stationary time series of the study period, the covariance is computed of the ROE, ROA and liquidity, with regulatory constraints issued by Law 10 for the year 1981, used the following statistical techniques:

Table 2. Group unit root test for regulatory constraints and financial performance during the period study

Tests	Statistic	Obs	Cross-sections	Prob.**
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-13.8434	2777	7	0.001***
ADF - Fisher Chi-square	220.536	2777	7	0.001***
PP - Fisher Chi-square	211.054	2786	7	0.001***
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-6.69540	2777	7	0.001***

*** $\alpha < (0.001)$.

As shown in the above table, the result shows that the stationary of the time series of the ROE (Y1), ROA (Y2), liquidity ratio (Y3), investment X1, cash X2, government securities and secure certificate (X3), and algorithm of total assets (lnx4), at level 1 (0) based on the constant level, through to the following criteria; LLC, IPSW, PP, and ADF, at a $\rho \geq (0.001)$, in consistence with **Mathew L. Higgins & Paul Thistle [2]**.

E. The model of Co-integrating equation

The purpose of this test is to measure the existence of long-term equilibrium relationship with non-stationary time series proxies ROE (Y1), ROA (Y2), liquidity (Y3), investment (X1), cash X2 government securities and secure certificate X3, and algorithm of total assets lnx4; this paper used Engle–Granger Co-integration tests in the following Table 3:

Table 3. The model of Co-integrating for financial performance with regulatory constraints

Variables	tau-statistic	Prob.*	z-statistic	Prob.*
ROE (Y ₁)	-15.92248	0.001***	-317.8018	0.001***
ROA (Y ₂)	-7.545909	0.001***	-101.1017	0.001***
L (Y ₃)	-8.353389	0.001***	-120.0785	0.001***
Investment (X ₁)	-8.795828	0.001***	-130.7136	0.001***
Cash (X ₂)	-7.869344	0.001***	-108.2697	0.001***
GOV. (X ₃)	-13.79549	0.001***	-263.3513	0.001***
LNx4	-8.654998	0.001***	-110.0235	0.001***

*** $\alpha < (0.001)$.

As shown in above Table 3, where panel A is dependent and independent variables, panel B Tau test panel C Prob. Panel D Z test shows that a long-run equilibrium associated among the (ROE Y1, ROA Y2, Liquidity Y3), and independent variables (X1, X2, X3, lnX4) from 1999 to 2019, based on the Tau-statistic, and z-statistic, at a significant level less than (0.001).

F. The Pearson correlation matrix tests

Table 4. Pearson correlation matrix to measure a significant linear relationship between the constructs of both regulatory constraints and financial performance variables

Constructs	ROE	ROA	Liquidity	Investment	Cash	Gov. Securities	Algorithm of total assets
ROE	1						
ROA	0.398***	1					
L	0.441***	0.439***	1				
Investment	-0.456***	-0.444***	-0.455***	1			
Cash	-0.491***	-0.493***	-0.384***	0.488***	1		
Gov. securities	-0.513***	-0.460***	-0.360***	0.484***	0.469***	1	
Algorithm of total assets	0.524***	0.522***	0.436***	-0.541***	-0.591***	-0.587***	1

*** $\alpha < (0.001)$.

Table 4 shows negative and significant linear correlations with the construct dependent variables ROE Y1, ROA (Y2), and liquidity (Y3) and the construct of the variables investment (X1), cash (X2), and government securities and secure certificate (X3), at a $\rho \geq (0.001)$. Also, there are positive and significant linear associated with the construct dependent variables in ROE (Y1), ROA (Y2), and liquidity (Y3) with the construct of algorithm of total assets (lnX4) at a $P \geq (0.001)$.

G. The model of SEM:

Salah Eladly [47] used structural equation model to investigate the multivariate functional data and conceptual framework using AMOS23. And Kuang Y Lee & Lexin Li [49] also used the structural equation model for estimating multivariate data. So, this paper has selected SEM because this technique provides the most efficient estimation techniques consisting of a series of separate multiple regression equations estimated simultaneously where constructs could be represented by a summated scale. Also SEM clearly distinguishes between unobserved theoretical constructs and imperfect empirical measures, and it is covariance-based rather than variance-based.

The following figure 1 shows SEM for investigating the construct of the independent proxies in terms of investment, cash, government securities and lnX4 on the construct of the dependent variables in terms of Return On Equity Y1, Return On Assets Y2, and Liquidity Y3.

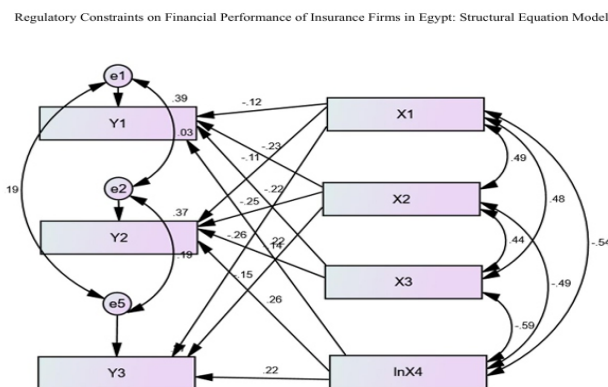


Figure 1. Structural Equation Model

Table 5. Regression weights for testing the effect of the construct of investment, cash, government securities and lnX4 on the construct of ROE, ROA, and liquidity for estimating Maximum Likelihood

	Path		Standardized estimate	Unstandardized estimate	S.E.	C.R.	SIG.
Y3	<---	X1	-.264	-.184	.031	-5.876	0.001***
Y1	<---	X2	-.230	-.221	.038	-5.755	0.001***
Y1	<---	X3	-.223	-.208	.039	-5.360	0.001***
Y2	<---	X3	-.139	-.137	.042	-3.290	0.001***
Y2	<---	lnX4	.257	.234	.041	5.669	0.001***
Y3	<---	lnX4	.222	.142	.029	4.928	0.001***
Y2	<---	X2	-.253	-.256	.041	-6.218	0.001***
Y1	<---	lnX4	.216	.186	.038	4.846	0.001***
Y3	<---	X2	-.147	-.105	.031	-3.384	0.001***
Y2	<---	X1	-.110	-.109	.042	-2.593	0.001***
Y1	<---	X1	-.120	-.113	.039	-2.876	0.004**

Normed Chi-Square=1.888 probability level=0.169 GFI=0.999 AGFI=0.973 NFI=0.999 IFI=0.999 TLI=0.987 CFI=0.999
RMSEA=0.040RFI=0.973, RMR= 0.006

*** $\alpha < (0.001)$. ** $\alpha < (0.01)$.

The results show for testing as following.

The model fit is evaluated in terms of ten indices as following as the table includes:

1. Where the value was 1.88, indexed value of Chi-Square with cut-off values $\geq (5)$
2. The value of Normed Fit Index (NFI) Value .999
3. The value of Goodness-of-fit index (GFI) value .999
4. The value of Tucker-Lewis Index .987
5. The value of -Adjusted Goodness of Fit Index .973
6. Relative Fit Index (RFI) value .973
7. The value Incremental Fit Index .999
8. The value Comparative Fit Index .999
9. The value of Root Mean Square Residual Approximation .040
10. The value of Root Mean Square Residual .006, if CFI > 0.95 then a model is satisfactory, GFI > 0.90, RMR < 0.08 and RMSEA < 0.08

The above table 5 shows the rejection of the first hypothesis.

The result of first hypotheses shows that testing of the relationship between the financial constraint and ROE shows a significant negative impact of the construct of investment (X1), cash (X2), and government securities and secure certificate (X3) as independent proxies on the construct of the dependent proxy in terms of return on equity (Y1), at a significant level less than (0.01), but the later the proxy of the algorithm of total assets (lnX4) has a positive impact on the proxy ROE (Y). This validates the first research hypothesis; the independent variables investment (X1), cash (X2), government securities and secure certificate (X3) and the algorithm of total assets (lnX4) have a significant impact on the ROE (Y1), with the regression model as the follows:

$$y_1 = -0.120x_1 - 0.230x_2 - 0.223x_3 + 0.216lnx_4$$

The exogenous proxies were accepted, investment (X1) cash, (X2) government securities and secure certificate (X3) and algorithm of total assets $\ln x_4$, in structural equation model explain (39.4%) from total variation of the variable; ROE (Y1), the rest percent comes from either the random error in the regression model or other Independent proxies excluded from regression model. This study is consistent with Aviner Augusto S. Manoel et al [34] and Minhua Yang [8] on the effect of the financial constraints on cash holding or ability to reinvest their profit on contrast of this paper as for Shan Ge [7] revealed that the financial constraints affected directly product prices, also this result is consistent with Siddarth Roche et al [22] that the firm size is a significant positive with regulatory constraints. On the other hand Martin F. Grace & Richard D. Phillips [1] and Minhua Yang [8] presented evidence of insurance domestic firms have high level of profitability.

Regarding to the second hypothesis, the results show that they are rejected. The result shows a negative and significant impact of the construct of the independent variables investment (X1), cash X2, and government securities on the construct of the dependent variables return on assets, at a $P \geq (0.01)$, but the later independent variable of the algorithm of total assets ($\ln x_4$) has a positive effect on the dependent variable of return on assets. This validates the second research hypothesis: the relationship between (investment X1, cash X2, government securities and secure certificate X3 and algorithm of total assets* $\ln x_4$) as the independent variables are a significant impact on return on assets as dependent variable in a regression model as follows:

$$y_2 = -0.110x_1 - 0.253x_2 - 0.139x_3 + 0.257\ln x_4$$

The exogenous proxies were accepted, investment (X1), cash X2, government securities and secure certificate (X3) and algorithm of total assets ($\ln x_4$) in structural equation model explain (37.1%) from total variation of dependent variable ROA (Y2), the rest percent comes from other the random error in the regression model and independent variables excluded from regression model, as for Clifford **A Ball & Hans R Stoll** [12] using operator training simulator model to evaluate the capital regulations requirements, documented the regulatory constraints requirements distort the investment decision and it is adversely affected in incentive investment in us banks but the difference in scope of applying on contrast with this study. For Georgios Efthyvoulou & Prit Vahter [36] whose finding refers to the positive relationship, contrast that study with Swamy V. [9], where the relationship between the financial regulations is positive with turn on equity.

The third hypothesis result shows that there is a significant negative impact of the construct of the independent proxies investment X1, and cash X2 on the construct of the dependent variables in terms of liquidity (Y3), at a $p \geq (0.001)$, but the later independent variable of algorithm of total assets $\ln x_4$ is a significant and positive impact on the dependent proxy of liquidity (Y3). This validates the third research hypothesis; regulatory constraints variables of investment (X1), cash (X2), and the algorithm of total assets ($\ln x_4$) have a significant effect on liquidity (Y3), with the regression model as follows:

$$Y_3 = -0.264X_1 - 0.147X_2 + 0.222\ln X_4$$

The exogenous variables were accepted, investment X1, cash X2, and the algorithm of total assets ($\ln x_4$) in SEM explain (27.3%) of the total variation of dependent variable; liquidity (Y3); the rest of percent comes from either the random error in the regression model or other independent variables excluded from the regression model.

Approximation (RMSEA) and Root Mean Square Residual (RMR) less than (0.08), which refers a close fit of the theoretical model to the actual model. Results consistent with Weixi Liu & Ian Tonks [43] concluded the negative relationship between the financial constraints with corruption, and the positive relationship with investment, and X. Chang et al [17] however, the government securities and secure certificate have insignificant relationship X3 with liquidity Y3.

6. Conclusions

This study used a sample structural equation model of regulatory constraints issued by Egyptian Financial Supervisory Authority under Law 10 for the year 1981 to examine the financial performance of Egyptian insurance firms measured by return on equity, return on assets and liquidity:

(1) The first hypothesis result shows that the relationship between regulatory constraints and return on equity is such that there is a significant negative effect of the construct the independent variables in terms of investment, cash, and government securities and secure certificates (X3), on the dependent proxy, return on equity, at a significant level less than (0.01). However, the later independent proxy of the algorithm of total assets (lnx4) has a positive impact on the dependent proxy in terms of return on equity. This validates the first research hypothesis, as the independent variables investment, cash, government, secure certificate, and algorithm of total assets have a significant effect on the dependent variable return on equity (Y1), which is consistent with Minhua Yang and Siddarth Roche et al [8, 22] in controlling for the variable size of the firm. This result contrast with Martin F. Grace & Richard D. Phillips [1], is also consistent with X. Chang et al [17]. This article presented evidence of insurance demotic firms which have a great level of regulations and achieved a high level of profitability, but some of the small domestic insurance firms have less profitability than the others.

(2) The Second hypothesis result shows a significant negative impact of the independent proxies investment, and cash on the dependent variables return on assets, at a significant level less than (0.001). However, the later independent variable of the algorithm of total assets (lnx4) has a positive effect on the dependent variable of return on assets. This validates the second research hypothesis, as the independent variables investment, cash, and algorithm of total assets (lnx4) have a significant effect on the dependent variable return on assets. On other hand, for **Nader Alber & Hatem Ramadan [5]** in banking sector, the result was positive in terms of liquidity constraints in banking performance.

(3) The third hypotheses finding indicates that a significant negative effect of the independent variables investment X1, and cash X2 on the dependent variable liquidity, at a significant level less than (0.001). However, the later independent variable of (lnx4) has a positive effect on the dependent variable liquidity. This validates the third research hypothesis, as the independent variables investment, cash, and algorithm of total assets have a significant effect on the dependent variable liquidity, but an insignificant relationship with government securities. This result was contrast with L. Nguyen & A. C. Worthington [3]. The result showed the regulations and size affected the efficiency of Australian private insurer.

Recommendations

- (1) The paper results conducted to investigate the negative relationship between the regulatory constraints and financial performance so the Egyptian financial authority should mitigate the Regulatory constraints in terms of investment channel and the investment ratio.
- (2) Future studies should test the suggestion ratio on financial performance.

REFERENCES

- [1] Martin F. Grace & Richard D. Phillips, *The Allocation of Governmental Regulatory Authority: Federalism and The case of insurance Regulations*, *The Journal of Risk and Insurance*, Vol. 74, No. 1, pp. 207-238, 2007, <https://doi.org/10.1111/j.1539-6975.2007.00208.x>.
- [2] Mathew L. Higgins & Paul Thistle, *Capacity constraints and the dynamic of underwriting profit*, *Economic Inquiry*, Vol. 38, No. 3, pp. 442-457, <https://doi.org/10.1111/j.1465-7295.2000.tb00028.x>, 2000,
- [3] L. Nguyen & A. C. Worthington, *Industry regulation, fund characteristics, and the efficiency of Australian private health insurers*, *Accounting and Finance*, Vol. 61, No. 1, pp. 781-801, 2021, <https://doi.org/10.1111/acfi.12593>.
- [4] Pablo Gonzalez & Lars F. Andersson, *Managing financial constraints: undercapitalization and underwriting capacity in Spanish fire insurance*, *Economic History Review*, Vol. 71, No. 2, pp. 567-592, 2018, <https://doi.org/10.1111/ehr.12529>
- [5] Nader Alber & Hatem Ramadan, *The Effect of Applying Banking Regulations on Banking Performance of MENA Region Countries*, *European Journal of Business and Management Research*, Vol. 7, No. 1, pp. 170-185, 2022, <http://dx.doi.org/10.24018/ejbmr.2022.7.1.1258>.
- [6] Lukas Ahnert, Pascal Vogt, Volker Vonhoff & F. Weiner, *Regulatory stress testing and bank performance*, *European Financial Management*, Vol. 26, No. 5, pp. 1449-1488, 2020, <https://doi.org/10.1111/eufm.12267>.
- [7] Shan Ge, *How Do Financial Constraints Affect Product Pricing? Evidence from Weather and Life Insurance Premiums*, *The Journal of the Finance*, Vol. 72, No. 1, pp. 449-503, 2022, <https://doi.org/10.1111/jofi.13093>.
- [8] Minhua Yang, *financial innovation regulations and firm performance: Evidence from Chinese listed firms*, *Austrian Economic Paper*, Vol. 61, No. 1, pp. 24-41, 2022, <https://doi.org/10.1111/1467-8454.12231>.
- [9] Swamy V., *Basel III capital regulations and bank profitability*. *Rev Finance Econ.*; Vol. 36, No. 4, pp. 307-320, 2018. <https://doi.org/10.1002/rfe.1023>.
- [10] Harald Benink, Jon D. & Asgeir Jonson, *On the Role of Regulatory Banking Capital*, *Financial Market Institution and Instrument*, Vol. 17, No. 1, pp. 85-96, 2008, <https://doi.org/10.1111/j.1468-0416.2007.00134.x>.
- [11] Yishu Fu, Shih c lee, Lie Xu & Ralf Z, *The Effectiveness of Capital Regulation on Bank Behavior in China*, *International of Review Finance*, Vol. 15, No. 3, pp. 321-345, 2015. <https://doi.org/10.1111/irfi.12045>.
- [12] Clifford A. Ball & Hans R Stoll, *Regulatory Capital of Financial Institutions: A Comparative Analysis*, *Financial Market Institution and Instrument*, Vol. 7, No. 3, pp. 1-57, 1998, <https://doi.org/10.1111/1468-0416.00020>.
- [13] Ansgar Walther, *Jointly Optimal Regulation of Bank Capital and Liquidity*, *Journal of Money, Credit and Banking*, Vol. 48, No. 2-3, pp. 415-448, 2016, <https://doi.org/10.1111/jmcb.12305>.
- [14] Eric Monnet & Miklos Vari, *A Dilemma between Liquidity Regulation and Monetary Policy: Some History and Theory*, *Journal of Money, Credit and Banking*, Vol. 55, No. 4, pp. 915-944, 2023, <https://doi.org/10.1111/jmcb.12930>.
- [15] Prachi Mishra & Ariel Reshef, *how do Central Bank Governors Matter r? Regulation and the Financial Sector*, *Journal of Money, Credit and Banking*, Vol. 51, No. 2-3, pp. 369-402, 2019, <https://doi.org/10.1111/jmcb.12578>.
- [16] Karas, M., & Režňáková, M., *The role of financial constraint factors in predicting SME default. Equilibrium. Quarterly Journal of Economics and Economic Policy*, Vol. 16, No. 4, pp.859–883, 2021,

DOI: 10.24136/eq.2021.032.

- [17] Xin Chang, Tek Jun Tan, George Wong, Hongfeng Zhang, *Effects of financial constraints on corporate policies in Australia*, *Accounting and Finance*, Vol. 47, No. 1, pp. 85-108, 2007, doi: 10.1111/j.1467-629x.2007.00200.x.
- [18] Xiang Zhang, Zongyi Zhang & Han Zhou, *Grabbing hand or financial constraint mitigation effect? A re-examination of the relationship between institutional development and cash holdings*, *Accounting and Finance*, Vol. 63, No. 1, pp. 631-655, 2023, DOI: 10.1111/acfi.12928.
- [19] Aaron lane, *Regulatory Constraints on Public Sector Innovation: A Case Study on Queensland's Independent Public School Program*, *Australian Journal of Public Administration*, Vol. 77, No. 4, pp. 685–699, 2017, doi: 10.1111/1467-8500.12307.
- [20] GuoHua Cao, WenJun Geng, Jing Zhang and Qi Li, *Financial constraints, short selling and corporate fraud: Evidence from China*, *Austrian Economic Paper*, Vol. 62, No. 1, pp. 297-320, 2022, <https://doi.org/10.1111/1467-8454.12284>.
- [21] Akamah, Herita T. and Omer, Thomas C. and Shu, Sydney Qing, *Financial Constraints and Future Tax Outcome Volatility*, *Journal of Business, Finance & Accounting*, Vol. 48, No. 3-4, pp. 1-44, 2020, <http://dx.doi.org/10.2139/ssrn.2803563>.
- [22] Siddarth Roche, Sizhe, Sizhong Sun and Riccardo Welters, *Financial Constraints Reduce Process Innovation? Evidence from Australian Firms*, *ECONOMIC RECORD*, Vol. 98, No. 323, pp. 335-353, <https://doi.org/10.1111/1475-4932.12703>. 2022,
- [23] Getaneh M. Ayele, *Does bank regulatory requirements affect risk-taking behaviour of private banks in Ethiopia?*, *International Journal of Finance and Economics*, Vol. 26, No. 3, pp. <https://doi.org/10.1002/ijfe.2026.4482-4492>, 2019,
- [24] Xin Chang, Tek J Tan, G. Wong & H. Zhang, *Effects of financial constraints on corporate policies in Australia*, *Accounting and Finance*, Vol. 47, No. 1, pp. 85-108, 2007, <https://doi.org/10.1111/j.1467-629X.2007.00200.x>.
- [25] Ralston, D., *The impact of regulatory reform on the portfolio performance of Australian credit unions*. *Economic Record*, Vol. 77, No. 237, pp. 167-182, 2001, <https://doi.org/10.1111/1475-4932.00012>.
- [26] Sasan Bakhtiari, R. Breunig & Lisa Magnani, *Financial Constraints and Small and Medium Enterprises: A Review*, *ECONOMIC RECORD*, Vol. 96, No. 315, pp. 506–523, 2020, <https://doi.org/10.1111/1475-4932.12560>.
- [27] Margaret J. Greenwood & Lei Tao, *Regulatory monitoring and university financial reporting quality: Agency and resource dependency perspectives*, *Financial, Accounting & Management*, Vol. 37, No. 2, pp. 163-183, 2019, <https://doi.org/10.1111/faam.12244>.
- [28] Annalisa Ferrando & Alessandro Ruggeri, *"Financial constraints and productivity: Evidence from euro area companies,"* *International Journal of Finance & Economics*, Vol 23, No. 3, pp. <https://doi.org/10.1002/ijfe.1615>. 257-282, 2018,
- [29] Ulf Von Kalckreuth, *Financial Constraints and Capacity Adjustment: Evidence from a Large Panel of Survey Data*, *Economica*, Vol. 73, No. 292, pp. 691-724, 2006, <https://doi.org/10.1111/j.1468-0335.2006.00514.x>.
- [30] Thomas S. Y. HO, Miguel Palacios & Hans R. Stoil, *Dynamic Financial System: Complexity, Fragility and Regulatory Principles*, *Financial Market Institution and Instrument*, Vol. 22, No. 1, pp. 1-42, 2013, <https://doi.org/10.1111/fmii.12002>.
- [31] Ornella W. Matetta & Vania Sena, *Financial constraints and technical efficiency some empirical evidence for Italian producers cooperatives*, *Annals of Public and Cooperative Economics*, Vol. 81, No. 1, pp. 21-38, 2010, <https://doi.org/10.1111/j.1467-8292.2009.00404.x>
- [32] Michael Machokoto & Geofry Areneke, *Does innovation and financial constraints affect the propensity to save in emerging markets?* *Journal of International Research Business and Finance*, Vol. 52, 2020, DOI: 10.1016/j.ribaf.2020.101185.

- [33] Annick Pamen Nyola Alain Sauviat & Amine Tarazi, *how does regulation affect the organizational form of foreign banks' presence in developing versus developed countries?*, *International Journal of Finance and Economics*, Vol. 27, No. 2, pp. 2367-2419, 2020, <https://doi.org/10.1002/ijfe.2278>.
- [34] Aviner A S. Manoel, Marcelo B. da C. Moraes & Juliano A de Araujo, *The effects of financial constraints on the market value of cash in a mandatory dividend context*, *International Journal of Finance & Economics*, 21 USP International Conference of Accounting, <https://doi.org/10.1002/ijfe.2719>. pp. 1-30, 2022,
- [35] Ofoeda, I., Amoah, L., Anarfo, E. B., & Abor, J. Y., *Financial inclusion and economic growth: What roles do institutions and financial regulation play?* *International Journal of Finance & Economics*, pp. 1–17, 2022, <https://doi.org/10.1002/ijfe.2709>.
- [36] Georgios Efthyvoulou & Prit Vahter, *FINANCIAL CONSTRAINTS, INNOVATION PERFORMANCE AND SECTORAL DISAGGREGATION*, *The Manchester School* Vol. 84, No. 2, pp. 125–158, 2016, doi: 10.1111/manc.12089.
- [37] Daniel Paravisini, *Local Bank Financial Constraints and Firm Access to External Finance*, *Journal of the Finance*, Vol. 63, No. 5, pp. 2161-2193, <https://doi.org/10.1111/j.1540-6261.2008.01393.x>. 2008,
- [38] Pablo G. G. & Lars-F. Andersson, *Managing financial constraints: undercapitalization and underwriting capacity in Spanish fire insurance*, *Economic History Review*, Vol. 71, No. 2, pp. 567-592, 2018, <https://doi.org/10.1111/ehr.12529>.
- [39] Fernando R. Chaddad & Jeffrey J. Reuer, *Investment dynamics and financial constraints in IPO firms*, *Strategic Entrepreneurship Journal*, Vol. 5, No. 1, pp. 29-45, 2009, <https://doi.org/10.1002/sej.65>.
- [40] Priya Nagarai & Chuanqian Zhang, *Regulatory quality, financial integration and equity cost of capital*, *Review of International Economics*, Vol. 27, No. 3, pp. 916-935, 2019, <https://doi.org/10.1111/roie.12403>.
- [41] Timothy J. Riddiough & Zhonghua Wu, *Financial Constraints, Liquidity Management and Investment*, *Real Estate Economics*, Vol. 37, No. 3, pp. 447-481, 2009, <https://doi.org/10.1111/j.1540-6229.2009.00248.x>.
- [42] Pateris Zilgalvis, *The Need for an Innovation Principle in Regulatory Impact Assessment: The Case of Finance and Innovation in Europe*, *Policy and Internet*, Vol. 6, No. 4, pp. 377-392, 2014, <https://doi.org/10.1002/1944-2866.POI374>.
- [43] Weixi Liu & Ian Tonks, *Pension Funding Constraints and Corporate Expenditures*, *Oxford Bulletin of Economics and Statistics*, Vol. 75, No. 2, pp. 235-258, 2013, <https://doi.org/10.1111/j.1468-0084.2012.00693.x>.
- [44] Pargati Priya & Chandan Sharma, *Do financial constraints and corruption limit firms' innovation capability? Evidence from developing economies*, *Managerial and Decision Economics*, Vol. 44, No. 4, pp. 1935-1961, 2023, <https://doi.org/10.1002/mde.3792>.
- [45] Nina Budina, Harry G & Eelke D, Jong, *Liquidity constraints and investment in transition economies*, *Economics of Transition and Institutional Change*, Vol. 8, No. 2, pp. 453-475, 2000, <https://doi.org/10.1111/1468-0351.00051>.
- [46] Ali Gungoraydinoglu & Özde Öztekin, *Financial crises, banking regulations, and corporate financing patterns around the world*, *International Review of Finance*, Vol. 22, No. 3, pp. 506-539, 2022 <https://doi.org/10.1111/irfi.12381>.
- [47] Salah Eladly, *risk performance on working capital management of insurance firms in Egypt*, *Universal Journal of Accounting and Finance*, Vol. 10, No. 1, pp. 47-61, 2022, <http://dx.doi.org/10.13189/ujaf.2022.100106>.
- [48] Jing Ai Vickie Bajtelsmit Tianyang Wang, *the Combined Effect of Enterprise Risk Management*

Effect of Enterprise Risk Management and Diversification on Property and Casualty Insurer Performance, The Journal of Risk and Insurance. Vol. 85, No. 2, pp. 513–543, 2018, DOI: 10.1111/jori.12166.

[49] *Kuang Y Lee & Lexin Li, Functional structural equation model, Journal of the Royal Statistical Society Series B: Statistical Methodology, Vol. 84, No. 2, pp. 600–629, 2022, <https://doi.org/10.1111/rssb.12471>.*

Unlocking the Efficiency of Artificial Intelligence in Financial Fraud Detection and its Integration into Audit Processes to Achieve Overall Audit Efficiency: A Comprehensive Analysis in Muscat, Oma

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ABSTRACT

Accounting fraud is a manipulating act done by the compilers of the financial statements and their supervisors alike by which the fraudulent manipulated financial statements to manipulate the financial position of the company resulting in the maximization of profits and hiding the losses. This study is conducted to evaluate the effectiveness of AI-based tools in detecting financial fraud compared to traditional audit techniques and to investigate the potential benefits and challenges of integrating AI-based tools into the audit process for fraud detection. It also aims to assess the impact of AI-based tools on overall audit efficiency, identify areas where they can be most effective, and explore the attitudes and perceptions of auditors towards using AI-based tools for fraud detection and the factors that influence their adoption. The study's findings highlight the potential of AI-powered solutions in improving auditing methods. AI technology can help auditors discover financial fraud, enhance audit efficiency, and optimize resource allocation. It further shows that these technologies may considerably improve the efficacy of identifying financial fraud, improve overall audit efficiency, and minimize audit time and resources.

Keywords Artificial Intelligence, Accounting Fraud, Audit Processes, Detection, Efficiency, Benefits and

1. INTRODUCTION

Artificial intelligence is the expertise of machines to simulate human intellect and accomplish activities that usually involve human intelligence, which includes learning, solving problems, decision-making skills, and understanding natural languages [1]. The evolution of technology has propelled considerable transformations in the businesses operations. In business organizations, auditing involves analyzing and testing a huge volume of transactions. Hence, testing and analyzing with the help of manual auditing is impracticable [2]. Fraud detection and prevention is a critical area of research in auditing, as fraudulent activities can have severe financial and reputational reparations for organizations. Researchers are exploring new techniques for detecting and preventing fraud, with a focus on using data analytics and artificial intelligence (AI) [3]. Data analytics is a powerful tool for fraud detection and prevention, as it allows auditors to analyze large amounts of data quickly and efficiently. Data analytics can help auditors identify unusual patterns or anomalies in financial data, which may indicate fraudulent activity. AI technologies, such as machine learning and natural language processing, can help auditors identify patterns in data and make predictions about future events [4]. For example, machine-learning algorithms can be used to analyze historical financial data to identify patterns of fraud, which can then be used to detect potential fraud in real time. Blockchain technology can help auditors track and verify financial transactions, while biometric authentication can help prevent identity fraud [5].

Each year, fraud costs investors a lot of money. Financial accounting fraud detection (FAFD) has emerged as a major area of interest for educators, researchers, and business communities due to the present state of the economy. The employment of specific techniques to detect financial accounting fraud is a result of the organization's internal auditing system's inability to detect accounting fraud [6]. Frauds that have an impact on issuers and their investors can include asset theft, improper financial reporting, and corruption [3]. Moreover, auditors are particularly interested in anomalies like fraud that cause a significantly misstated financial report since they are legally obligated to find and disclose such irregularities. Significant inconsistencies include purposeful actions, personnel fraud, management fraud, and mistakes [7]. Artificial Intelligence provides an effective solution to this mounting challenge. AI analyzes enormous volumes of data from varied sources, encompassing financial operations, emails, and social media activities to spot delicate patterns and inconsistencies revealing misleading behavior [8].

1.1. Accounting Fraud

Accounting fraud is a manipulating act done by the compilers of the financial statements and their supervisors alike by which the fraudulent manipulated financial statements to manipulate the financial position of the company resulting maximization of profits and hiding the losses. Fraudulent activities include a range of dishonest methods like misappropriation, and cybercrime, manipulation of accounts, inflicting substantial financial losses on companies, and destroying public trust. According to the Association of Certified Fraud Examiners (ACFE), companies worldwide lose 5% of their revenue to fraud, amounting to trillions of dollars yearly [9]. Fraud detection in corporations is very important to get accurate financial statements that are free from material misstatements and are true and fair. Businesses increasingly face the challenge of detecting financial fraud and maintaining the integrity of financial statements, so it becomes imperative to explore the potential of artificial intelligence (AI) in revolutionizing the audit process [10]. The problem revolves around the effectiveness and integration of AI-based tools in detecting financial fraud and achieving overall audit efficiency. Traditional audit techniques may not be equipped to handle the complexity and scale of modern financial fraud, thereby necessitating the exploration of AI-powered solutions [3]. Additionally, the attitudes and perceptions of auditors towards AI-based tools and the factors influencing their adoption need to be examined. Large entities, in particular, encounter significant challenges when it comes to detecting errors and fraud. The primary concern revolves around the risk of material misstatement, which has proven to cause substantial financial losses for companies. To mitigate these risks and ensure the accuracy of financial reports, auditors must design and implement robust auditing fraud detection models. These models enable auditors to gather adequate and appropriate audit evidence, thereby minimizing the occurrence of errors and fraudulent activities. By designing and executing an effective audit model, auditors can obtain the necessary audit evidence to identify and mitigate the risk of material misstatement. This proactive approach plays a vital role in safeguarding the integrity and reliability of financial reports [11].

In addition, it is very important to determine whether AI powered tools outperform traditional methods in identifying fraudulent activities within financial statements. By comparing the accuracy and efficiency of AI-based tools with traditional audit techniques, the research aims to provide insights into the effectiveness of AI in detecting financial fraud. It is also imperative to know the potential benefits and challenges of integrating AI-based tools into the audit process for fraud detection. Lastly, it is very crucial to know the impact of AI-based tools on overall audit efficiency and identify areas where they can be most effective. The purpose of this research is to investigate how AI-powered tools can help

auditors identify errors and fraud and how these tools can be integrated into the auditing process to enhance overall audit efficiency.

2. Objectives of the Study

1. To evaluate the effectiveness of AI-based tools in detecting financial fraud compared to traditional audit techniques
2. To investigate the potential benefits and challenges of integrating AI-based tools into the audit process for fraud detection.
3. To assess the impact of AI-based tools on overall audit efficiency and identify areas where they can be most effective.
4. To explore the attitudes and perceptions of auditors towards the use of AI-based tools for fraud detection and the factors that influence their adoption.

3. Literature Review and Hypothesis Development

3.1. Use of AI-Powered Tools in Auditing in Detecting Errors and Frauds

George et al. [12] studied how auditors make use of Big Data in their audit engagement. The study explored sociomateriality literature, observation, and interviews with individuals who are directly connected to big data analytics. The findings indicated that properties of big data analytics such as scripts have made large-scale automation of audit routines, expanding evidential scope and digging down to the core areas. The study also indicated that visualization dashboards have contributed to auditor ability to communicate their claims and professional judgment. In addition, Werner et al. [10] investigated how process mining can be integrated into the audit practices by evaluating the audit standards. The study indicates the probability of incorporating process mining within financial statement audits by following auditing standards and GAAP. The result also indicates that the use of process mining techniques increases the reliability of overall audit conclusions, and improves overall audit efficiency by replacing manual audit procedures. Nonnenmacher & Gómez [13] used auto-encoders as an unsupervised method in auditing practices in a practical case study. The result shows that the use of auto encoders can help auditors in the audit practices, and audit-planning processes, and enhance overall audit quality of audit engagement. Hakami et al. [14] clarified that all businesses, financial statement fraud, and other types of fraud pose a serious threat. According to a 2016 report from the Association of Certified Fraud Examiners (ACFE), only 3.7% of all fraud cases worldwide occur in the Middle East, which includes all six Gulf Cooperation Council (GCC) nations. Additionally, earlier research showed that financial statement fraud detection models like the Beneish M score, Dechow F score, and Altman Z-score are crucial indicators of fraud.

As pointed out by Salim [15] in their study identified that fraud has become much more complicated and challenging to detect, particularly when it is surreptitious in nature and committed by top management who are skilled at hiding it. In this context, auditors have maintained that the detection of fraud should not be their responsibility.

3.2. AI Integrated Auditing

According to Beneish [16] and Irwandi et al. [17], if agency theory is taken into consideration, agency issues, specifically the lack of interest alignment between owners and management, are the root cause of the low disclosure of information in financial reporting. According to Kothari et al. [18], information

asymmetry between managers and shareholders gives managers the freedom to select the accounting techniques and profit estimates that are used to report a company's earnings, allowing management to manage earnings. The result is that fraud detection is a crucial issue. Fraud detection skills quickly become essential. Because there are so many different reasons why financial statements can be fraudulent as well as so many different ways to detect them, finding fraudulent financial statements is not always easy. Ileberi et al. [19] explain how AI algorithms are used to detect financial fraud in credit card transactions. The study found that AI-based models were able to detect fraudulent transactions with high accuracy and could provide actual alerts to avoid additional damage. Haqq & Budiwitjaksono [20] explain that "Pentagon Theory's" ability to identify fraud in financial reporting will be tested. The study found that the data help to determine whether all possible factors can affect financial statement fraud. The data used in this study were secondary. Only the Indonesia Stock Exchange provided the sample data used in the study.

Huang [21] examined the body of knowledge regarding the application of machine learning techniques for financial statement fraud detection. The performance of various machine learning methods, such as decision trees, neural networks, and support vector machines, is compared by the authors. The outcomes demonstrate that the accuracy of the support vector machine is superior to that of other methods. Xie et al. [22] explained about a machine learning-based fraud detection system. According to the study's findings, the system can identify false financial statements with an accuracy of 97.5%.

3.3. AI-Powered Tools and Overall Audit Efficiency

Gregory [23] explains the nature of accounting and auditing issues, along with the necessity of applying artificial intelligence (AI) technologies to the field. The discussion includes current accounting issues, particularly auditing, for which new AI development should be beneficial. Both qualitative and quantitative research designs were used in this study. Macailao [24] identified three challenges faced by internal auditors which are personal and social threats, the fraud style and techniques of the perpetrators, and the organizational barriers to the internal auditors. Utilizing secondary quantitative data. Wyrobek et al. [25] identify the possibility of the enterprise experiencing significant financial irregularities. These imbalances might be connected to various forms of financial fraud that do not always have an impact on the annual financial statements. Large-scale irregularities that significantly harm a company's reputation are a hallmark of irregularities. The study's results suggest that machine learning and artificial intelligence algorithms can effectively identify and learn to recognize patterns in these scams.

Jensen [26] explains how AI technology is used to detect money laundering in financial statements; the study assesses the technical and societal effects of the Federal government's extended use of AI technologies for fraud detection. Its findings apply to many other uses of AI technology for fraud detection in the public and private sectors. The study found that the OTA was unable to imagine any system without significant social and economic costs. Nonnenmacher & Gómez [13] carried out a thorough analysis of previous studies that use unsupervised anomaly detection in an auditing context. The findings show that most studies only develop an approach for one particular dataset and do not address integration into the audit process or how the findings should be presented to the auditor.

Past studies show that when the economy's status, industry, and the company's position in operation threaten financial stability, managers are under pressure to execute deceptive financial statements. Management is frequently under pressure to demonstrate that the firm has managed assets successfully, generating more gain that would subsequently yield substantial returns for investors. This poses a major

threat for auditors to unearth errors and fraud in financial statements. Consequently, auditors are increasingly using AI-powered tools to detect errors and frauds in this highly digitalized era. This study focuses on the effectiveness of the AI tools in identifying the errors and frauds and, how auditors can integrate these tools to make the auditing process more effective.

Based on the literature reviews, the authors propose three null hypotheses to statistically evaluate to determine if they can be rejected.

H01: The use of AI-based tools does not significantly increase the effectiveness of detecting financial fraud.

H02: Integrating AI-based tools into the audit process does not significantly improve overall audit efficiency

H03: There is no significant correlation between the use of AI-based tools and the reduction of time and resources required to conduct an audit.

4. Data and Methodology

This research uses a descriptive quantitative research method, which uses both primary and secondary data. Primary data were collected through a structured questionnaire. A pilot study was conducted to test the content validity of the questionnaire. After some minor modifications, the questionnaire was distributed through Google Forms to auditors who have work experience using Artificial intelligence-based tools in financial fraud detection. The questionnaire comprises of 20 close-ended questions and three open-ended questions. In addition, secondary data were collected from industry reports and related articles to provide adequate background information.

The researchers distributed the questionnaire to 100 external auditors working in various companies in Muscat, Sultanate of Oman, generating a response of 83%. The data so collected were subjected to the cleaning process, and three responses that were found to be incomplete were removed and tabulated using MS Excel. Finally, data analysis was done using SPSS.

5. Results and Interpretation

5.1. Summary of Demographic Profile

Data collected show that 38% of respondents are women and 61% of respondents are men. According to the data, the age group of 18 to 25 years had the highest percentage of respondents (53.8%), followed by the age groups of 26 to 34 and 35 to 43, which together accounted for 21.3% of all respondents. The lowest rate, however, was 2.5% for respondents between the ages of 44 and 52. Out of 80 respondents, about 53.8% have experience of up to four years. Additionally, about 17.5% have experience of five to eight years. 15% were between 9 and 13 years old. However, 10% of them are auditors with experience between 14 and 17 years. The study illustrates the industry in which auditors typically work. 50% of the respondents are audited in the banking industry, which is a significant number. There is, however, some representation in other industries as well, including the service sector, manufacturing, insurance, and retail, where 8.8% of auditors work in the insurance industry, 7.5% in the service industry, and 6.3% in the latter. A sizeable portion of the entire sample (22.5%) is made up of respondents who work in occupations that aren't specifically mentioned under the category "Others," which includes them.

. Additionally, with a percentage of 5%, auditors employed in the manufacturing sector had the lowest percentage.

Table 1 shows that there is a strong positive correlation (0.706) between AI-powered tools and AI-powered detection of errors and frauds. The result also shows a strong positive correlation (0.606) between AI-powered tools in auditing and AI Integrated auditing. There is a moderate positive correlation (0.545) between AI-powered tools and Overall audit efficiency, and a moderate positive correlation (0.565) between AI-powered tools in Auditing and AI-integrated auditing. However, the result indicates that there is a low positive correlation (0.431) between the AI-powered tools used in auditing and overall audit efficiency. This means that auditors are in favor of using AI-powered tools in detecting frauds and errors but not in favor of using AI-powered tools to increase overall efficiency.

Table 1. Correlation Analysis

	AI-powered tools in Auditing	AI-powered detection of errors and frauds	AI-integrated auditing	AI-powered overall audit efficiency
AI-powered tools in Auditing	1			
AI-powered detection of errors and frauds	0.706**	1		
AI-integrated auditing	0.565**	0.606**	1	
AI-powered overall audit efficiency	0.431**	0.545**	0.587**	1

Source: Calculations based on responses from the questionnaire

5.2. Regression Analysis

Regression analysis has been carried out to test the null hypotheses and the results are presented as follows:

Hypothesis 1

H01= The use of AI-based tools does not significantly increase the effectiveness of detecting financial fraud.

Table 2 displays the model summary. The R-value of 0.706 shows a moderate positive correlation between the predictor variable and the outcome variable. This means that when the predictor variable increases the outcome variable also increases moderately. The R-squared value of 0.498 indicates that AI-powered tools influence 49.8% of the variance in the dependent variable (effectiveness of AI in detecting financial fraud).

Table 2. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.706	0.498	0.492	0.433
a. Predictors: (Constant), AI-powered tools				

Source: Calculations based on Questionnaire survey

Table 3 indicates the ANOVA values. A p-value of <0.001 suggests that there is a high significant relationship between the use of AI-powered tools in auditing and the detection of errors and frauds by the auditors. Hence, at a 5% level of significance, the null hypothesis (H01) is rejected. It can be concluded that the use of AI-based tools significantly increases the effectiveness of detecting financial fraud.

Table 3. ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	14.492	1	14.492	77.402	<0.001
	Residual	14.604	78	0.187		
	Total	29.096	79			
a. Dependent Variable: AI-powered auditing tools in the detection of error and frauds						
b. Predictors: (Constant), AI-powered tools						

Source: Calculations based on Questionnaire survey

Hypothesis 2 1

H02= Integrating AI-based tools into the audit process does not significantly improve overall audit efficiency. The R-value of 0.565 shown in Table 4 displays a moderate relationship between the predictor variable and the outcome variable. Each point of increase in predictor variable leads to a corresponding increase in outcome variable but moderately. The R-squared value of 0.319 indicates that AI-powered tools influence 31.9% of the variance in the dependent variable (effectiveness of AI in improving overall audit efficiency).

Table 4. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.565	0.319	0.31	0.457
a. Predictors: (Constant), AI-powered tools				

Source: Calculations based on Questionnaire survey

The P-Value of 0.001 in Table 5 shows that there is a high significant relation between the AI-powered tools used in auditing and the integration of the same to increase the overall audit efficiency. At a 5 % level of significance, there is not enough evidence to accept the Null hypothesis. Hence, it is rejected. It can be concluded that integrating AI-based tools into the audit process significantly improves overall audit efficiency.

Table 5. ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.643	1	7.643	36.565	<0.0001
	Residual	16.304	78	0.209		
	Total	23.947	79			
a. Dependent Variable: Overall Audit Efficiency						
b. Predictors: (Constant), AI-powered tools						

Source: Calculations based on Questionnaire survey

Hypothesis 3

H03=There is no significant correlation between the use of AI-based tools and the reduction of time and resources required to conduct an audit (Overall audit efficiency). The R-value of 0.545 shown in Table 6 indicates a moderate relationship between the predictor variable and the outcome variable. Each point of increase in predictor variable leads to a corresponding increase in outcome variable but moderately.

Table 6. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.545	0.297	0.288	0.475
a. Predictors: (Constant), AI-powered auditing tools in the detection of error and frauds				

Source: Calculations based on Questionnaire survey

Table 7 shows that the p-value is <0.001 which is below 5% level of significance. Hence, the null hypothesis (H03) is rejected. To summarize, the study's Regression analysis offered empirical data to support the hypotheses examined. The findings revealed substantial links between the usage of AI-powered tools and identifying financial fraud, boosting overall audit efficiency, and saving audit time and resources. These findings provide important insights into the potential benefits of using AI technology in auditing methods.

Table 7. ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7.413	1	7.413	32.918	<.0001
	Residual	17.566	78	0.225		
	Total	24.979	79			
a. Dependent Variable: AI-powered tools and overall audit efficiency						
b. Predictors: (Constant), AI-powered auditing tools and detection of error and frauds						

Source: Calculations based on Questionnaire survey

6. Benefits and Challenges of Integrating AI in Auditing

According to the auditors, integrating AI-based tools into the audit process offers numerous advantages along with some challenges. The positive side, as expressed by the auditors, highlights how these tools can enhance task management, ensuring the successful completion of all tasks. They also facilitate faster auditing procedures, potentially saving time and enabling more in-depth analyses. With the use of AI tools, auditors can detect fraudulent activities more effectively, thereby improving fraud detection capabilities. Moreover, the incorporation of AI has the potential to enhance overall audit quality, increase output, and generate long-term cost savings.

However, some challenges need to be considered. Many auditors express concerns about the high initial cost associated with implementing AI-based tools. Despite the advantages offered by AI tools, there

there may be a slow adoption rate. The comprehensive analysis provided by AI tools may result in false alarms or false positives. Ethical issues such as bias and data security threats need to be addressed when using AI in auditing. Additionally, implementing AI-based tools may require significant time and effort, particularly when replacing outdated techniques and systems. It is important to note that these opinions on the benefits and challenges of integrating AI into the audit process are based on the responses received and may vary depending on the specific AI tools used and the context of implementation.

7. Findings and Discussions

The study highlighted several important uses of AI powered tools in auditing and their impact on detecting errors, frauds, and overall audit efficiency, and the reduction of time and resources required to implement an audit. The study found that there is a moderately high positive correlation (0.706) between the use of AI-powered tools in auditing and the detection of errors and frauds, this indicates that auditors view AI-powered tools favorably in terms of their effectiveness in identifying financial irregularities. The study also found that there is a moderate positive correlation (0.656) exists between the uses of AI powered tools in auditing and AI-integrated auditing. This suggests that auditors see a link between utilizing AI-powered tools and integrating AI technology into the whole audit process. There was also a low positive correlation (0.431) between the use of AI-powered tools in auditing and overall audit efficiency. This suggests that while auditors recognize the effectiveness of AI tools in detecting errors and fraud, they may not observe them as significantly enhancing the overall efficiency of the audit process.

Regression analysis was conducted to test the three hypotheses regarding the use of AI-based tools in auditing. The findings indicate significant relationships between the use of AI-powered tools and detecting financial fraud, improving overall audit efficiency, and reducing the time and resources required for audits. Hypothesis 1 states that the use of AI-based tools does not significantly increase the effectiveness of detecting financial fraud. However, the Regression analysis provided evidence to reject this null hypothesis. The high moderate positive correlation ($R = 0.706$) between the use of AI-powered tools and the detection of errors and fraud suggests that auditors perceive AI tools as effective in identifying financial irregularities. The p-value of <0.001 indicates a statistically significant relationship, rejecting the null hypothesis that AI-based tools do not significantly increase the effectiveness of detecting financial fraud.

Hypothesis 2 proposed that integrating AI-based tools into the audit process does not significantly improve overall audit efficiency. However, the Regression analysis showed a moderate positive correlation ($R = 0.565$) between the use of AI-powered tools and AI-integrated auditing. Each point of increase in the use of AI-powered tools corresponds to a corresponding but moderate increase in overall audit efficiency. The p-value of < 0.001 suggests a statistically significant relationship, leading to the rejection of the null hypothesis. Thus, it can be concluded that integrating AI-based tools into the audit process significantly improves overall audit efficiency.

Hypothesis 3 suggested that there is no significant correlation between the use of AI-based tools and the reduction of time and resources required to conduct an audit. However, the Regression analysis provided evidence to reject this null hypothesis as well. The moderate correlation ($R = 0.545$) between the use of AI-powered tools and the reduction of time and resources needed for audits rejects the null hypothesis. The p-value of 0.001 indicates a statistically significant relationship, indicating that the use of AI-based tools is associated with a reduction in time and resources required for audits.

In summary, the findings from the Regression analysis provide robust support for the hypotheses tested. Auditors perceive AI-powered tools as effective in detecting financial fraud, and integrating AI-based tools into the audit process enhances overall audit efficiency and reduces the time and resources required for audits. These findings have significant implications for auditing practices, highlighting the potential benefits of AI technology in improving the effectiveness and efficiency of audits. Furthermore, these findings contribute to the existing literature on AI in auditing by providing empirical evidence for the positive impact of AI-based tools. The results suggest that auditors should embrace AI technology to enhance their ability to detect fraud, improve overall audit efficiency, and optimize resource allocation. However, it is important to note that the findings are based on the specific sample and context of the study.

Further research is needed to validate and generalize these findings across different settings and populations. In conclusion, the findings from this Regression analysis support the use of AI-powered tools in auditing. The results indicate that AI-based tools significantly enhance the effectiveness of detecting financial fraud, improve overall audit efficiency, and reduce the time and resources required for audits. These findings have practical implications for auditors and can guide organizations in adopting AI technology to optimize their auditing processes.

8. Conclusions

This study investigated the usage of AI-powered tools in auditing and their influence on detecting mistakes, fraud, overall audit efficiency, and the reduction of audit time and resources. The findings give insights into external auditors' perspectives and experiences in the Sultanate of Oman. The study revealed numerous notable conclusions about the usage of AI-powered tools in auditing. To begin, the study discovered a relatively strong positive link between the employment of AI-powered tools and the detection of mistakes and fraud. This shows that auditors value AI systems for their efficacy in detecting financial fraud. The findings suggest that AI-powered solutions can improve auditors' capacity to recognize and resolve fraudulent activity, contributing to the overall efficacy of the auditing process. Second, the research found a moderately good relationship between the adoption of AI-powered products and AI-integrated audits. This means that auditors see a relationship between using AI-powered tools and incorporating AI technology throughout the audit process. Auditors may use AI solutions to expedite their audit operations and improve the quality and efficiency of their work by combining sophisticated algorithms and data analysis skills.

In addition, the study found a weak positive association between the usage of AI-powered tools and overall audit efficiency. While auditors recognize the value of AI technologies in detecting mistakes and fraud, they may not see them as greatly improving the audit process's overall efficiency. This conclusion implies that, in addition to the employment of AI techniques, other factors may influence audit efficiency. It emphasizes the need to take into account many aspects of audit procedures, such as communication, coordination, and workflow optimization, in conjunction with the integration of AI-powered technologies, to achieve efficiency advantages. The study's Regression analysis offered empirical data to support the hypotheses examined. The findings revealed substantial links between the usage of AI-powered tools and identifying financial fraud, boosting overall audit efficiency, and saving audit time and resources. These findings provide important insights into the potential benefits of using AI technology in auditing methods.

The sample for the study included 80 external auditors from diverse businesses in the Sultanate of

Oman. The sample's demographics indicated a broadly equal gender distribution, with a little greater number of male auditors. Furthermore, the majority of respondents were younger in showing that the usage of AI-powered technologies in auditing is being welcomed by the younger generation of auditors. It should be noted that the study's findings are particular to the Sultanate of Oman and may not be immediately generalizable to other locations or nations. To confirm and expand on the findings, more research is needed to repeat the study in diverse locations and demographics.

Finally, the study's findings highlight the potential of AI powered solutions in improving auditing methods. AI technology can help auditors discover financial fraud, enhance overall audit efficiency, and optimize resource allocation. The use of AI technologies should be examined in conjunction with other aspects that contribute to audit effectiveness and efficiency. As technology advances, auditors and businesses should stay open to using AIpowered solutions to improve the quality and efficiency of auditing operations.

9. Recommendations

Based on the study's findings, numerous suggestions may be given to auditors, companies, and legislators to maximize the benefits of AI-powered auditing tools:

Auditors should actively accept and investigate the use of AI-powered tools in their auditing operations. The outcomes of the study show that these technologies may considerably improve the efficacy of identifying financial fraud, improve overall audit efficiency, and minimize audit time and resources. Auditors should look for ways to incorporate AI technology into their procedures and workflows to enhance their capabilities and obtain better audit results.

To fully realize the promise of AI-powered tools, auditors need to engage in training and education programs that improve their understanding and competency with these technologies. Building technical competence and experience with AI algorithms and data analytics will help auditors use AI-powered solutions efficiently and maximize their advantages in their jobs. Upskilling auditors in AI-related knowledge and abilities should be prioritized in continuous professional growth. Encourage cooperation between auditors and data scientists. Harnessing the power of AI technology in auditing requires collaboration between auditors and data scientists. Crossfunctional collaboration between auditors and data science teams should be facilitated and encouraged by organizations. Auditors and data scientists may collaborate to design and enhance AI models, optimize algorithms, and use advanced analytics approaches to improving audit procedures and outcomes.

Businesses should invest in the creation of industry specific AI apps that are suited to the specific demands and problems of various industries. The report emphasized the substantial representation of auditors employed in the banking business. Similar AI solutions for individual industries can be built to address industry-specific hazards, rules, and complexity. Auditors may conduct more focused and successful audits by matching AI solutions with the unique requirements of different sectors. To encourage knowledge-sharing and cooperation, auditing businesses, professional organizations, and academic institutions should promote knowledge-sharing and collaboration in the field of artificial intelligence in auditing. Creating venues for auditors to discuss best practices, case studies, and research results can help to promote learning and innovation. Collaboration between academics and industry can also help to further the development of cutting-edge AI technology and auditing approaches. Auditors and organizations must be diligent in monitoring ethical implications and

can also help to further the development of cutting-edge AI technology and auditing approaches. Auditors and organizations must be diligent in monitoring ethical implications and ensuring the proper use of AI-powered technologies as AI technology improves. Ethical norms and procedures should be devised to handle concerns such as data privacy, algorithm bias, and the possible influence on auditing employment. To encourage responsible AI deployment, ethical awareness, and considerations should be embedded into AI training programs for auditors.

This study gives useful insights on the advantages of AI powered auditing tools. More study is needed, however, to confirm and generalize these findings across other situations and groups. Future research should look into the long-term impacts of AI integration, the influence on auditor-client relationships, and potential adoption hurdles. To continuously enhance knowledge and techniques, policymakers, funding agencies, and academic institutions should support and encourage research initiatives in the field of AI in auditing. Finally, auditors, organizations, and governments should embrace AI-powered auditing tools, engage in training and cooperation, create industry-specific apps, stimulate knowledge-sharing, monitor ethical implications, and support more research. By implementing these guidelines, auditors may improve their capacity to detect financial crime, increase audit efficiency, and optimize resource allocation, resulting in more effective and efficient auditing processes in the AI era.

10. Limitations of the Study and Scope for Future Research

This research covers the perception of auditors on the use of AI tools in bringing transparency to financial statement audits. Future research may be directed at finding how AI tools can offer more productive results in identifying errors and frauds by analyzing real-time data. Future researchers can also investigate the Implementation of specific AI tools through case studies or simulation experiments. Examine the cost-benefit effects of Artificial Intelligence integration in different audit contexts.

REFERENCES

- [1] Russell, Stuart J., and Peter Norvig. *Artificial intelligence: a modern approach*. Pearson, 2016.
- [2] Puthukulam, G., Ravikumar, A., Sharma, R. V. K., & Meesaala, K. M., "Auditors' perception on the impact of artificial intelligence on professional skepticism and judgment in Oman," *Universal Journal of Accounting and Finance*, Vol. 9, no. 5, pp. 1184-1190, 2021. https://ds.amu.edu.et/xmlui/bitstream/handle/123456789/1_0406/artificial%20intelligence%20-%20a%20modern%20approach%20%283rd%2C%202009%29.pdf?sequence=1
- [3] Munter, P., "The Auditor's Responsibility for Fraud Detection," U.S. Securities and Exchange Commission, 2022, <https://www.sec.gov/news/statement/munterstatement-fraud-detection-101122>
- [4] Gupta, P., "Leveraging Machine Learning and Artificial Intelligence for Fraud Prevention," *SSRG International Journal of Computer Science and Engineering*, Vol. 10, no. 5, pp. 47-52, 2023. <https://doi.org/10.14445/23488387/IJCSE-V10I5P107>
- [5] Taherdoost, H., "Blockchain and Machine Learning: A Critical Review on Security," *Information*, Vol. 14, no. 5, 295, 2023, <https://doi.org/10.3390/info14050295>
- [6] Sharma, A., & Panigrahi, P. K., "A review of financial accounting fraud detection based on data mining techniques," *arXiv preprint arXiv:1309.3944*, 2013.
- [7] Krambia-Kapardis, M., "A fraud detection model: A must for auditors," *Journal of Financial Regulation and Compliance*, Vol. 10, no. 3, pp. 266-278, 2002.
- [8] OECD, "Artificial Intelligence, Machine Learning and Big Data in Finance: Opportunities, Challenges, and Implications for Policy Makers," 2021. <https://www.oecd.org/finance/artificial->

-intelligence-machine-learningbigdata-in-finance.htm.

- [9] Bartulović, M., Perkušić, D., & Kovačević, I., "Differences in business fraud between state-owned and private companies: case of Croatia," *Financial internet quarterly*, Vol. 19, no. 4, pp. 1-8, 2023.
- [10] Werner, M., Wiese, M., & Maas, A., "Embedding process mining into financial statement audits," *International Journal of Accounting Information Systems*, Vol. 41, p. 100514, 2021.
- [11] Alles, M. G., Kogan, A., & Vasarhelyi, M. A., "Audit automation for implementing continuous auditing: Principles and problems," *Rutgers Business School*, Vol. 1, pp. 1-24, 2008.
- [12] George, G., Haas, M. R., & Pentland, A., "Big data and management," *Academy of management Journal*, Vol. 57, no. 2, pp. 321-326, 2014.
- [13] Nonnenmacher, J., & Gómez, J. M., "Unsupervised anomaly detection for internal auditing: Literature review and research agenda," *International Journal of Digital Accounting Research*, Vol. 21, pp. 1-22, 2021.
- [14] Hakami, T. A., Rahmat, M. M., Yaacob, M. H., & Saleh, N. M., "Fraud Detection Gap between Auditor and Fraud Detection Models: Evidence from Gulf Cooperation Council," *Asian Journal of Accounting & Governance*, Vol. 13, pp. 1-13, 2020.
- [15] Salim, M. S., "An overview of research on auditor's responsibility to detect fraud on financial statement," *Journal of Global Business Management*, Vol. 8, no. 2, p. 218, 2012.
- [16] Beneish, M. D., "The detection of earnings manipulation," *Financial Analysts Journal*, Vol. 55, no. 5, pp. 24-36, 1999.
- [17] Irwandi, S. A., Ghozali, I., & Pamungkas, I. D., "Detection fraudulent financial statement: Beneish M-score model," *WSEAS Transactions on Business and Economics*, Vol. 16, no. 1, pp. 271-281, 2019.
- [18] Kothari, S.P., Leone, A.J., Wasley, C.E., "Performance matched discretionary accrual measures," *Journal of Accounting and Economics*, Vol. 39, no. 1, pp. 163-197, 2005.
- [19] Ileberi, E., Sun, Y., & Wang, Z., "A machine learning based credit card fraud detection using the GA algorithm for feature selection," *Journal of Big Data*, Vol. 9, no. 1, pp. 117, 2022.
- [20] Haqq, A. P. N. A., & Budiwitjaksono, G. S., "Fraud pentagon for detecting financial statement fraud," *Journal of Economics, Business, and Accountancy Ventura*, Vol. 22, no. 3, pp. 319-332, 2019.
- [21] Huang, Shaio Yan. "Fraud detection model by using support vector machine techniques," *International Journal of Digital Content Technology and its Applications*, Vol. 7, no. 2, p. 32, 2013.
- [22] Xie, Y., Wu, K., Zhao, T., & Gao, X., "Research and Design of Dynamic Strategy Distributed Control Architecture in Power Internet of Things," *In 2020 International Conference on Artificial Intelligence and Computer Engineering (ICAICE)*, pp. 403-407, IEEE, 2020.
- [23] Gregory A., "Planning and managing public relations campaigns: A strategic approach," Kogan Page Publishers, 2020.
- [24] Macailao, M., "The internal auditors beyond auditing norms," *Journal of Critical Reviews*, Vol. 7, no. 11, pp. 6770, 2020.
- [25] Wyrobek, J., Poplawski, L., & Surowka, M. "Identification of a fraudulent organizational culture in enterprises listed in Warsaw stock exchange," *European Research Studies Journal*, Vol. 23, Special issue no. 2, pp. 622-637, 2020.
- [26] Jensen, D., "Prospective assessment of AI technologies for fraud detection," *Working Papers of the AAAI-99 Workshop on Artificial Intelligence Approaches to Fraud Detection and Risk Management*, 1997.

The Influence of IFRS Adoption on FDI and Economic Growth: Evidence from Nigeria

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ABSTRACT

This research study analyzes the influence of the adoption of International financial reporting standards (IFRS) on foreign direct investments (FDI) inflows and economic growth in Nigeria. Institutional quality indicators are incorporated into the study to assess their mediating impact on the relationship between the independent and dependent variables. FDI inflows and economic growth are used as dependent variables in the study, while the independent variable is IFRS adoption. Time series data spanning from 2004 to 2022 is used to obtain the research findings. Multivariate analysis of covariance (MANCOVA) is used to test for the difference in FDI inflows and economic growth during the pre-IFRS and post-IFRS adoption periods. Mediating analysis indicated a significant positive effect of IFRS adoption on economic growth, with institutional variables influencing the relationship. Based on the research findings of this study, IFRS adoption positively contributes to economic growth by fostering the private domestic businesses and investments within the country. While, a negative influence of IFRS adoption on FDI inflows was revealed in the study findings with institutional quality factors playing a significant mediating role. This study supports the view that though IFRS adoption is expected to foster FDI inflows, in countries with weak institutional qualities its influence proves to be minimal. Adequate disclosures under IFRS are essential for promoting transparency, a critical factor currently lacking in many Nigerian companies. Further, IFRS is aimed at enhancing the value relevance of accounting information thereby ensuring international comparability, providing quality financial information and allowing both foreign and domestic investors rely on financial statements in making investing and economic decisions. However, the findings of this study prove that IFRS adoption in Nigeria has not been successful in bringing value relevant financial information. Therefore, it is vital to establish solid institutional and corporate governance structures to enforce compliance with IFRS in financial statement preparation, reflecting actual company earnings and financial performance to encourage increase in FDI inflows and economic growth.

Keywords IFRS Adoption, FDI Inflows, Economic Growth, MANCOVA

1. INTRODUCTION

International financial reporting standards (IFRS) have proven to foster integrity accountability, and reliability of financial structure as well as corporate governance [1]. The demand for consistent financial reporting and accounting standards has grown as a result of international expansions, enabling cross-border capital transfers. IFRS serves as a worldwide accounting standard that harmonizes financial reporting, and as such assists international businesses operating across borders to improve the consistency of accounting information, hence, increasing comparability and dependability of accounting information across international borders [2]. Furthermore, in boosting foreign trade and investments across country borders the adoption of IFRS has also proved to substantially reduce information asymmetries and costs [3].

Nigeria in particular, along with other African nations, is unable to use domestic funds to fund all of their domestic investments. Most of the government budgets are deficit driven. Capital flows and investments from around the world are used to finance these trade and current account imbalances [4]. In addition, the economic growth of the nation is plagued with political unrest, rapid population expansion, faulty social structures and high levels of corruption [5]. Hence, FDI inflows are important and vital to the Nigerian economy to foster economic expansions and growth. In order to attract FDI inflows, a strong financial reporting system that generates accurate and credible accounting information is necessary to enable international investors assess risk in relation to potential returns [6]. However, World bank statistics indicates that FDI inflows to Nigeria have decreased since the implementation of IFRS in 2012.

Nigeria's adoption of IFRS is part of the government's economic reform and initiative aimed at boosting FDI inflows and economic growth. Hence, studying the implications of the adoption of IFRS on the Nigerian economy is crucial for this reason.

Many studies have been carried out to investigate the consequences of IFRS adoption, with some of the studies concentrating on the corporate aspect [1], [7]. While other researchers have probed into the effects of IFRS adoption on cross border investments in terms of FDI [8], [9], [10]. And some other researchers have focused on the economic aspect in terms of gross domestic product [11], [12], [13]. According to previous researches, adopting IFRS increases a country's appeal and viability for FDI, which increases its inflow of FDI and economic growth [14]. The current study is driven by the theory that Nigeria's adoption of IFRS may diverge from the worldwide trend and aims to shed light on a broader range of IFRS's effects on the economy as a whole, as regards to FDI inflows and Nigeria's economic growth [15]. This study also investigates into the role that the quality of institution and governance structures play in effectiveness of IFRS in promoting Nigerian FDI inflows and economic growth. Therefore, this study is a valuable contribution to the body of research on IFRS, FDI inflows, and economic growth.

Although empirical studies have separately explored the links between the adoption of IFRS and FDI inflows, as well as the relationship between IFRS and economic growth, the role of institutional quality in this context within Nigeria has yet to be thoroughly examined. The study aims to determine if there have been any notable shifts in Nigeria's level of foreign direct investment inflows and economic growth following the implementation of IFRS. Also, this research investigates whether the adoption of IFRS has had a substantial impact on the volume of foreign direct investment inflows and economic growth of Nigeria while controlling for institutional quality.

This study differs from prior studies in threefold. First, unlike prior studies that focused on the single aspect of the economy in relation to either FDI inflows [16], [17] or economic growth [13], [18], this study synthesizes these two major aspects of the economy. Hence, the study approach provides a holistic review of how the adoption of IFRS influences both FDI inflows and economic growth as essential components in the Nigerian economy. We argue that though FDI inflows and economic growth are interconnected, there is a possibility that IFRS adoption affects them differently. Therefore, even if one aspect of the economy experiences growth due to IFRS adoption, the other may face challenges.

Secondly, the current study assesses how institutional quality variables, such as regulatory quality and political stability, play a role in mediating the effects of IFRS adoption on FDI and economic growth in

Nigeria. Thirdly, we conduct an analysis of the pre- and post-IFRS periods in relation to FDI inflows and economic growth in Nigeria over an extended timeframe to determine the long-term relationship between these variables, while also controlling for institutional quality.

This introduction serves as section one of the paper's five sections. In the second section, the conceptual, theoretical, and empirical literature is reviewed. Section three of the paper presents the methodology, while section four contains the results, findings and discussions. The paper's conclusions, and recommendations are presented in section 5.

2. Review of Related Literature

2.1. Conceptual Framework

2.1.1. International Financial Reporting Standard (IFRS)

IFRS are created by the International Accounting Standards Board (IASB) as a collection of worldwide accounting standard that outlines how specific kinds of transactions and other occurrences should be represented in financial statements. These accounting standards offer guidelines for the creation and presentation of financial statements across different countries [19]. The gradual adoption of IFRS in many countries lowers and eliminates the costs of obtaining information for decision-making. IFRS supports investors in global markets and promotes foreign capital inflows into the nations that implement them. Increased disclosure improves accounting quality, capital market efficiency and in turn the flow of foreign investments. Furthermore, IFRS has proven to significantly reduce information asymmetry, uncertainty and estimation risk [20]. Efforts to harmonize and internationalize financial reporting in response to the demands of national integration and the global market gave rise to IFRS. The notion of comprehensive income, the principle-based methodology, and the fair value orientation are among the characteristics of IFRS [19].

Adoption of IFRS has the advantage of saving capital market investors' costs which are associated with processing and reviewing financial information. Additionally, IFRS encourages accountants and financial report auditors to become familiar with a single set of worldwide accounting standards rather than a variety of regional accounting standards [21]. Notably, the adoption of IFRS, facilitates financial statement uniformity and comparability between nations and enterprises, which eases the work of investment analysts [22], [19]. Furthermore, one of the primary objectives of IFRS is to attract foreign investors in addition to liberalizing the capital market generally. Nonetheless, there have been critics who argue against the implementation of IFRS, particularly for developing nations [15], [23].

Research indicates that adopting IFRS yields greater economic benefits in economies with established institutional quality. Countries with solid institutions experience more advantages from IFRS in attracting FDI inflows compared to those with weaker corporate governance and institutional structures [24]. Further, it has been stated that the unpredictability of the political and economic landscapes in many emerging nations, along with their underdeveloped institutions, could make it more difficult to successfully apply IFRS. In the sense that the harmonization of reporting by the IFRS may not align completely with the distinct characteristics of countries that fall under the category of developing or less developed. Additionally, the diverse enforcement practices and policies of IFRS in various countries contribute to the differing levels of accounting quality observed globally [25]. The absence of timely loss recognition and concerns surrounding earnings management have emerged as a negative consequence of adopting IFRS in Nigerian companies [26]. Studies indicate that adopting IFRS can

resulted in decline in accounting quality and has notably compromised the autonomy of countries by limiting their control over accounting standards [26]. Additionally, research shows that the transition from GAAP to IFRS has led to significant reduction in the value relevance of intangible assets [27].

2.1.2. Background to International Financial Reporting Standard (IFRS) in Nigeria

Prior to the adoption of International Financial Reporting Standards (IFRS), financial reporting in Nigeria was governed by the Nigerian Accounting Standards, regulated by the Nigerian Accounting Standards Board (NASB). Nigerian accounting standards aligned with International Financial Reporting Standards (IFRS) on January 1, 2012, enhancing the country's regulatory framework [28]. Nigeria adopted IFRS to address the inadequate quality and quantity of financial disclosures that existed prior to this implementation [29]. To facilitate the transition, the NASB implemented a phased approach, requiring publicly traded companies and entities of significant public interest to fully adhere to IFRS by January 1, 2012. Small and medium-sized businesses were given until January 2014 to adopt IFRS [30]. The initiative was established with the primary objective of promoting uniformity, enhancing international comparability, and ensuring transparency in financial reporting. Such measures were aimed to attract increased foreign direct investment (FDI) and support sustainable economic growth within the nation. However, enforcement agencies and financial regulatory bodies have been minimally engaged in facilitating the transition to IFRS as its major financial reporting language [31]. Research indicates that Nigeria's readiness to implement IFRS transparently is still unclear, despite the official adoption [31]. Nigeria has been characterized by weak institutional quality, which has influenced the country's overall affairs [32]. The quality of institutions has been linked to the success or failure of IFRS in attracting foreign direct investment (FDI) inflows and fostering economic growth [15]. By focusing on strengthening these institutions, Nigeria could unlock its full potential for development and investment. According to indicators provided by World bank, since the adoption of IFRS in 2012, Nigeria has experienced a gradual decline in foreign direct investment (FDI) inflows through 2024. This trend highlights an opportunity to investigate the specific contexts influencing these changes. While IFRS is expected to enhance FDI inflows, the resultant benefits appear to be highly contextual. Despite the negative correlation identified between IFRS and FDI inflows, Nigeria has successfully sustained economic growth.

2.1.3. Foreign Direct Investment (FDI)

Foreign direct investment (FDI) is regarded as a vital channel for both direct technology distribution and a significant means of technical transfer due to the lack of funding in less developed nations [33]. A business in which a foreign investor controls ten percent or more of the common stock or voting power of an incorporated business or the equivalent of an unincorporated business is classified as a foreign direct investment (FDI) enterprise [34]. Accordingly, FDI is expected to enhance economic growth by facilitating the transfer of technologies. Due to FDI, modern technology developed in advanced economies through research and development is transferred to the host countries. Advanced technologies are transmitted to domestic business through foreign investors present in the host country. This technological advantage aids in promoting the growth of local businesses as well as the growth in the host economy. Also, FDI facilitates the flow of resources from the foreign investor to the host country. FDI helps a host nation's economy by providing capital that would not otherwise be accessible to promote that country's economic growth.

To foster FDI inflows into the host country, governments around the world have implemented IFRS

[19]. However, regulatory quality, political stability, government effectiveness, rule of law, voice and accountability have proven to increase FDI inflows as institutional quality indicators [24]. Also, the level of prevalence of institutional quality indicators in the host country matters in attracting FDI inflows. This means that the implementation of IFRS in a country does not necessarily guarantee high inflows of FDI. However, the presence of strong institutional quality enhances the effect of IFRS in increasing FDI inflows in the host country.

2.1.4. Economic Growth

Economic growth measures the yearly increase or rise in the output of goods and services. A country is deemed to have experienced economic growth when its Gross National Product (GNP) exceeds its previous level [35]. The Gross domestic product (GDP) and Gross National Product (GNP) calculate an economy's total output and total revenue for a specific time period. A consistent rise in the output of goods and services is referred to as economic growth, indicated by the GDP (Gross Domestic Product) per capita calculation [36]. GDP is calculated by summing the value of all generated goods and services [37]. Economic growth is necessary because a stagnant economy increases the budget deficit. It is also socially vital since it reduces social tension brought on by rising unemployment and deteriorating living standards [38].

According to the theory of growth, with the help of IFRS adoption, an increase in accounting transparency fosters cross border and foreign direct investments [39]. Consequently, FDI significantly influences economic growth through knowledge transfer, with technical advancement being viewed as an endogenous component [40]. However, other factors play significant roles in economic growth apart from FDI. Macroeconomic variables and institutional quality structures also play a significant role in the state of economic growth of a country [41], [42]. Apart from FDI inflows, institutional quality factors including regulatory quality, political stability, government effectiveness, and rule of law of a country play a significant role in the level of economic growth of a country [41]. These governance factors have also proved to affect the effect of IFRS on the increase or decrease of a country's economic growth [11]. Based on these prior research findings, institutional quality variables are included in the conceptual framework for this study.

2.2. Theoretical Review

There are numerous studies that address IFRS as a means of promoting FDI inflows as well as economic growth in the body of existing literature on emerging market nations [12,43]. In literature, FDI inflows have been proven to be a source of capital flows across nations, aids in the facilitation of tech spillovers, employment creation and increased productivity and efficiency internationally [17]. Asheghian [44] emphasized that domestic investment, and foreign direct investment are key drivers of economic growth. This notion supports the view that economic growth results from a structure's internal activities which then attracts external benefits [45], which is in line with endogenous Growth Theory, proposed in 1965. Long-term economic growth that is endogenous is propelled by forces internal to the economic system, usually those regulatory and institutional factors in charge of developmental progress and technology. And as such, the internal factors of institutional quality such as the levels of regulatory quality, government effectiveness, political stability and rule of law are paramount in attracting FDI inflows which in turn influence the level of economic growth in any country [11]. These internal structures can be used alongside IFRS in standardizing domestic business operations and reassuring domestic and foreign investors which in turn ensure economic growth. The endogenous growth hypothesis views growth as a component of innovation advancement represented in this study by IFRS adoption. The adoption of IFRS as part of a country's internal regulatory structure can aid in attracting

FDI while sustainably increasing economic growth rates through innovation interchange, dispersion, and overflow effects, which are perceived as growth accelerators in endogenous regions [46].

On the one hand, some scholars argue that there is no significant positive relationship between FDI and economic growth [40]. While other scholars, are of the view that FDI plays a crucial role in enhancing a nation's economic growth [18]. However, the contingency theory posits that IFRS adoption would only be profitable if the standards were adjusted to the local environment [47]. Nonetheless, literature in this field of study indicates that the ability of FDI to improve the economy is mostly dependent on a number of elements distinct to each nation. Economic and institutional variables frequently function as mediators in the relationship between FDI and economic growth [48, 49]. This supports the Dunning's Eclectic Paradigm. This theory explains that FDI is driven by investors seeking efficiency, expanding markets and those in search of optimum resources. The theory places strong emphasis on the host country's overall policy structure in terms of trade openness, favorable regulations and infrastructures. Consequently, the adoption of IFRS tends to increase the locational appeal of compliant countries to international investors due to its ability to foster accounting quality, understandability and reliability.

Hence, it is more likely that a country with high business opportunities, standardized regulatory or institutional structures, lower FDI costs and standardized financial reporting will attract more FDI than other countries without.

Harmonized accounting data resulting from the adoption of a common set of standards is typically viewed as advantageous since it would lessen information asymmetry between the various stakeholders, allowing the financial markets to allocate resources more effectively [47]. According to the Information Asymmetry theory, one major factor contributing to information asymmetry for international investors is variations in national accounting rules and procedures [50]. As information asymmetry and agency costs tend to decrease, the adoption of IFRS is expected to send a positive signal to investors due to the higher disclosure standards and improved quality of financial reporting that result from it [51]. In support of Information Asymmetry theory, research studies overtime have discovered that host nations with strong institutions quality in terms of regulatory quality and political stability are more appealing for FDI flows to multinational corporations [9], [19], [52]. Also, with the implementation of IFRS, domestic investments are also fostered due to uniformity in the preparation of financial statements. These also help in promoting economic growth by the movement of private capital within the domestic or local markets [53]. Nonetheless, endogenous growth theory claims that FDI is more productive than domestic investments due to the fact that FDI encourages the integration of new technology into the host country.

2.3. Empirical Review

2.3.1. IFRS adoption and FDI

Previous research on the relationship between IFRS and FDI has produced conflicting results [14], [15], [19], [43]. [1] and [14] report a positive and significant relationship between IFRS adoption and FDI. This implies that adopting IFRS will help countries improve the quality of their reporting environment, which will increase FDI inflows [54]. While, [15], [19], [43] indicate a negative relationship between IFRS adoption and FDI. With the negative association between FDI and IFRS adoption, researchers are of the view that FDI inflows are declining even after the implementation of IFRS based on their study conclusions. They explain that IFRS adoption alone does not ensure FDI influx [15], [23].

Lungu [43] investigated into impact of IFRS adoption on FDI particularly in European emerging countries. The study made use of Ordinary least square and Pearson correlation methodology in analyzing secondary data collected based on the period from 1994 to 2014. Macroeconomic variables were included as control variables for their research model specification. The results of their research indicated that countries who adopted IFRS received higher FDI inflows than countries without IFRS. Also, Owusu et al. [52] investigated whether FDI inflows to developing nations that have embraced IFRS outperform those to non-adopting nations. The study also looked at how institutional quality at the national level influences the relationship between FDI inflows and the adoption of IFRS. Panel data from 116 developing nations were used in the study. The relationship between the variables was examined using the effective two-step System Generalized Method of Moments (GMM). The findings of the research showed a positive relationship between IFRS adoption and FDI inflows in the countries that adopted IFRS. However, the study's findings also indicated that the volume of FDI inflows to developing nations is not impacted by the implementation of IFRS alone.

Musah et al. [54] looked at how FDI inflows into Africa were affected by the introduction of IFRS. This study sampled just African nations that have adopted IFRS in order to ascertain if the adoption has boosted FDI inflows, in contrast to earlier studies that sampled both adopting and non-adopting countries. In order to accomplish this goal, a sample of 20 African nations that have implemented IFRS from 1980 to 2015 was taken. Macroeconomic factors such as GDP, trade openness, public debt, and population growth were included as control variables. Using correlation and regression analysis, the findings showed that adoption of IFRS has a favorable and significant impact on foreign direct investment inflows into Africa. Conversely, there was a strong and positive correlation between FDI and population growth, government debt, and an open economy. Also, the researchers concluded that the adoption of IFRS has a favorable impact on the flow of foreign direct investments (FDIs). Akpomi and Nnadi [55] using a sample of 48 African nations, probed into the relationship between IFRS and FDI. Fixed effect model for the regression was used to arrive at the research findings. The research results proved that there is a positive and significant effect of IFRS adoption on FDI. Additionally, the findings also proved that regulatory quality serves as a motivator for IFRS standard compliance. Furthermore, the researchers believed that improved regulation increases trade openness and transparency, which will reinforce the impact of IFRS adoption on FDI flow.

Jinadu et al. [1] investigate if Nigerian FDI has been considerably impacted by the implementation of International Financial Reporting Standards (IFRS). The study primarily looks into the opinions of those who write annual reports and those who utilize them in listed companies in Nigeria that have implemented IFRS. Structured questionnaires were distributed and analyzed to arrive at the research results. Regression techniques were employed for data analysis. The results showed a positive and significant relationship between FDI and the adoption of IFRS. The outcome additionally demonstrated the noteworthy influence of international investors on listed companies that have implemented IFRS in Nigeria. With the aid of Generalized method of moments and panel fixed effects methodology, Akisik and Mangaliso [14] researched into the relationship between IFRS and FDI flows and their influence on economic growth of selected African countries. The researchers particularly focused on greenfield investments, mergers and acquisitions as specific types of FDI. Their research findings noted a positive relationship between the adoption of IFRS in the African countries and the types of FDI flows in the study. Their study also uncovered a positive relationship between adoption of IFRS and economic growth.

Despite the widespread perception that IFRS adoption promotes foreign direct investment (FDI) and trade, Nnadi and Soobaroyen [15] offer evidence to the contrary for the African countries. They discover that institutional structures like the legal system and the degree of corruption have a greater impact on the rise in FDI in these nations than the adoption of IFRS, underscoring the essential role that a nation's institutional and legal framework play. The results of Nnadi and Soobaroyen [15] study support the idea that implementing IFRS is insufficient to achieve the benefits that the prior studies suggest. On the same side of findings, Tsegba, et al. [19] researched into the relationship between IFRS adoption and FDI flows into anglophone west African countries. The study was based on ten years. Secondary data collected from world bank and world governance indicators were analyzed using panel regression analysis. The research findings indicated that there is no significant effect of IFRS adoption on FDI inflows. Also, in Nigeria specifically, the results showed a negative relationship between IFRS adoption and FDI inflows. The researchers noted that FDI inflows into Nigeria notably reduced after the adoption of IFRS.

In the same vein, Udofia [23] using a structured questionnaire as the data collection tool, examined the effects of IFRS implementation on cross-border investment, including Foreign Portfolio Investment (FPI) and FDI in Nigeria, between 2007 and 2016. The study used independent t-test analysis and Levene's test, two inferential statistical techniques, together with content analysis. The study's findings showed that the volume of FDI and FPI inflows were more during the pre-adoption era than they were during the post-adoption period. As a result, a negative relationship between IFRS adoption and FDI was connoted in the research findings. Based on the research findings, the analysis revealed that a number of other factors that were not taken into account in the study affect cross-border investment in Nigeria rather than the adoption of IFRS alone having a sole impact on it. Leykun [24] also found a negative effect of full IFRS adoption on FDI inflows. The scholar explained that macroeconomic factors including infrastructure, trade openness and human capital had the most influence in attracting FDI to Sub Saharan African Countries.

The positive association between FDI and IFRS adoption was consistent with the findings of [1], [54]. However, some academics, such as Tsegba et al. [19] and Udofia [23], discovered that IFRS implementation does not encourage foreign direct investment.

2.3.2. IFRS Adoption and Economic Growth

With the aid of accounting, accurate information is provided to ensure informed decisions in terms of allocating resources amongst alternative investment opportunities [22]. Opong and Aga [56] supported the view that IFRS adoption encourages economic growth in developing countries. The researchers made their investigation based on the period between 2005 to 2014. The study covered both developing and developed countries. The researchers concluded that IFRS plays a more significant role in developing countries than developed countries in the European Union. Also, Ajibade et al. [12] investigated into the effects of IFRS adoption on economic growth using paired sample t-test. The data collected was based on the period between 2000 to 2016 on manufacturing gross domestic product as the dependent variable. The results of their analysis showed a significant difference in economic growth between the pre and post IFRS adoption periods. Based on these, the researchers discovered a significant positive relationship between IFRS adoption and economic growth.

Owusu et al. [11] found evidence that strong institutional and governance factors moderate the IFRS-economic growth link. Their research discovered that countries that adopt IFRS have faster economic

growth link. Their research discovered that countries that adopt IFRS have faster economic growth than nonadopting countries. Using panel data for the years between 1996 and 2013 for developing countries. The efficient twostep system generalized methods of moment (GMM) estimation technique was used in this study. These findings are line with the findings of Akisik and Mangaliso [14]. The research results of Owusu et al. [11] also support the notion that the implementation of IFRS leads to the increase in economic growth into the host country. Similarly, Elhamma [10] sought to evaluate the impact of IFRS adoption on economic growth after the Covid-19 pandemic. They used panel data spanning from 2017 to 2020. Data were gathered and analyzed using the fixed effect estimating technique along with Generalized Least Squares. The study discovered a positive impact of IFRS adoption on economic growth. However, they also discovered that the pandemic contributed to reducing the increasing effect of IFRS on economic growth.

On the other side of findings, Abdullaeva et al. [13] assessed the relationship between IFRS adoption and economic growth in transition economies. The research was based on the period between 2005 to 2018. GDP was used as the dependent variable in the study. While political stability, voice and accountability, corruption, education rate and rule of law among others were used as control variables. Difference in difference model was utilized in arriving at the research results. The results of the study indicated a negative but insignificant relationship between IFRS and economic growth. Moreover, Ugwu and Okoye [57] carried out a research on the effects of FDI on economic growth during the period of post adoption of IFRS. Their research findings in Nigeria indicated that post adoption of IFRS, FDI inflows was not significant in increasing economic growth. The researchers agreed that rather than depending just on the adoption of IFRS to attract foreign direct investment (FDI) and promote development, countries should also consider other elements that would foster FDI and economic growth, such as institutional characteristics and infrastructure.

Furthermore, Avwokeni [48] examined the effect of IFRS adoption on gross domestic product as well as corporate social disclosure in Nigeria. It was discovered that IFRS adoption reduces gross domestic product. The researcher contends that, while not significantly, the adoption of IFRS lowers a nation's national income numbers. A number of scholars have studied how IFRS affect GDP as a proxy for economic growth in their works. Most seems to agree that IFRS have an impact on economic growth, however there has been disagreement about the exact nature and extent of this impact due to inconsistent findings across various studies. On the positive side of findings, [11], [12], [14], [52], [56] conducted research on the influence of IFRS on economic growth in several countries and discovered a positive correlation between IFRS and economic growth. In contrast, [13], [57], [58] discovered a negative association between IFRS and economic growth. Based on the variations in prior research findings, the following hypothesis is developed:

Hypothesis 1: There are significant differences in both FDI inflows and economic growth between the pre-IFRS and post-IFRS periods in Nigeria.

Hypothesis 2: IFRS adoption positively influences FDI inflows.

Hypothesis 3: IFRS adoption positively influences Economic growth.

Hypothesis 4: The influence of IFRS adoption on FDI inflows and economic growth is mediated by institutional quality factors in Nigeria.

3. Materials and Methods

3.1. Data and Empirical Strategy

The study used time series data to determine the effect of IFRS adoption on FDI inflows and economic growth in Nigeria. According to Daske and Gebhart [6] the impacts of IFRS might not be evident in the short term but more obvious in the long run. Based on this the study covers the year from 2004 to 2022. The research period was divided into two parts: pre-IFRS and post IFRS. The pre-IFRS period spanned from 2004 to 2011 when Nigerian Accounting Standards were in effect. Nigeria first adopted IFRS in 2012, marking the beginning of the post-IFRS period, which covers 2012 to 2022. The dependent variables include FDI inflows measured as net FDI inflows and economic growth measured with Gross domestic product. The main independent variable is IFRS adoption measured as a dummy variable to represent the period from 2004 to 2011 as pre-IFRS adoption and period after the adoption of IFRS from year 2012 to 2022 as post-IFRS adoption. The study includes two institutional quality indicators including regulatory quality and political stability which were sourced from the world governance index. These institutional quality indicators were used as covariates with direct relations to FDI flows and Gross domestic products. The World Governance Index measures institutional qualities and traits that range from around -2.5 (weak) to 2.5 (strong) governance performance. Time series data on net FDI inflows, economic growth and institutional quality indicators based on the period between 2004 and 2022 was collected from world bank indicators and analyzed. In accordance to the time series data, the existence of two dependent variables and dummy variables, descriptive statistics and multivariate analysis of covariances methodologies are adopted.

3.2. Multivariate Analysis of Covariance (MANCOVA)

Multivariate analysis of covariance (MANCOVA) is utilized because this study involves multiple dependent variables and the goal of the research is to define the level of relevance of one variable over another in order to determine the interaction between variables. The purpose of this study is to determine how important independent variables including IFRS adoption and other covariates relate to dependent variables through their interaction. The Pillai's trace, also known as the Pillai-Bartlett trace, V , and its significance level are utilized. This multivariate test is thought to be the most dependable [59]. The query "Is each effect significant?" is addressed by this, or "For at least one of the dependent variables, is each effect significant?" and accepts values between "0" and "1". The greater the Pillai's trace, the more significant and important the given effect is to the model.

In order to model relationships between dependent and independent variables, the standard regression model typically uses quantitative data. There are times when qualitative data may be assumed to have an impact on the dependent variable and, as such, need to be included in the regression model. This can be accomplished by using dummy variables, which have values of 0 or 1, respectively, denoting the existence or absence of that characteristic. Accordingly, this is the case in this study, as IFRS adoption is represented as a dummy variable. The dummy variable makes it possible to quantitatively evaluate how the qualitative variable affects the dependent variable. Multivariate Analysis of covariance (MANCOVA) is regression that combine dummy and quantitative variables. The MANCOVA models offer a way to statistically manage the effects of quantitative regressors, also known as covariates or control variables [59]. Hence, this study conducts multivariate analysis using a general linear model in the statistical package for the social sciences (SPSS) to examine the effects of pre and post-IFRS on FDI inflows while establishing institutional factors as covariates.

3.3. Model Specification

To examine the data and put the theories to the test, multivariate analysis is used. The models under

Multivariate Analysis of covariance (MANCOVA) included in this study use foreign direct investments and economic growth as dependent variables. The models of this study built on the model of Leykun [24] though economic growth is added here to get a better understanding of the effect of IFRS adoption in relation to the economy. Equation 1 indicates the first model, which examines the relation between the presence of pre and post IFRS adoption and net FDI inflows. The interaction terms to investigate the potential for the covariates to interact with IFRS adoption in determining FDI inflows are also addressed by the first model:

$$LNFDI = \beta_0 + \beta_1PREIFRS + \beta_1POSTIFRS + \beta_1PS + \beta_1RQ + \varepsilon. \quad (1)$$

Where FDI = foreign direct investment, PS = political stability and RQ = Regulatory quality. The second model examines the relation between pre-IFRS, post-IFRS adoption and economic growth proxied by GDP. Equation 2 also indicates interactive terms to investigate the potential for regulatory quality and political instability to interact with the adoption of IFRS in determining FDI inflows. Model 2 is specified as follows

$$LNGDP = \beta_0 + \beta_1PREIFRS + \beta_1POSTIFRS + \beta_1PS + \beta_1RQ + \varepsilon \quad (2)$$

where GDP = Gross domestic product.

4. Results and Research Analysis

4.1. Descriptive Statistics

Table 1 contains the results of the descriptive statistics for the selected variables of this study. The mean, standard deviation, minimum and maximum values are provided in Table 1. Between 2004 to 2011, FDI inflows had a mean value of .7189. The descriptive statistics showed significant variations in FDI, with a standard deviation of 0.2624. The results indicated that the average FDI inflows before the adoption of IFRS in 2012 was higher than post IFRS. Standard deviation for FDI also indicated a higher value post IFRS than pre IFRS adoption. Therefore, it can be concluded that compared to the pre-IFRS period, the post-IFRS period is marked by greater fluctuations in the FDI. Low mean values in FDI inflows post IFRS, imply that inflow of FDI into Nigeria reduced in recent times contrary to high expected inflows. This is evidently portrayed by the findings of Udofia [23]. Although IFRS adoption is expected and forecasted to increase FDI inflows [14], [54]. Some scholars, have proven the opposite to be true in Nigeria as a result of factors including institutional, governance and macroeconomic variables [15], [19], [23].

As regards the second independent variable, the average GDP increased in Nigeria post-IFRS. The results indicated a mean of 7.5219 for the period between 2004 to 2014 and a mean of 7.7572 for the period between 2012 to 2022. Based on the mean values, GDP increased after the adoption of IFRS in Nigeria. This is consistent with the findings of [57], who found that FDI inflows did not significantly contribute to economic growth after the introduction of IFRS. This is proven to be true due to the results showing that FDI reduces after IFRS adoption and as such does not contribute to economic growth. Further, standard deviation for GDP of .17070 indicated a lower value post IFRS than .33074 pre IFRS adoption. Regulatory quality as a covariate in this study, indicated a slight increase on average while political stability according to the mean values remained considerably almost the same. Tsegba et al. [19] have proved that weak institutional and governance factors including political stability and

regulatory quality can negatively impact FDI inflows and consequently economic growth.

Table 1. Descriptive Statistics results

Statistics	Mean		Std. Deviation		Min.		Max.	
	Pre IFRS	Post IFRS	Pre IFRS	Post IFRS	Pre IFRS	Post IFRS	Pre IFRS	Post IFRS
FDI	.71897	-.77380	.26241	.98706	.32235	-3.2308	1.0647	.06722
GDP	7.5219	7.7572	.33074	.17070	6.9004	7.5714	7.9113	8.0712
Regulatory Quality	-.8511	-.9210	.18347	.12261	-1.29	-1.16	-.70	-.68
Political Stability	-1.9467	-1.9520	.16348	.12309	-2.21	-2.13	-1.67	-1.79

4.2. MANCOVA Results

Table 2 shows that the MANCOVA results indicate significant differences in both FDI inflows and economic growth between the two periods while controlling for institutional variables. Hence, based on the MANCOVA results and descriptive statistics we accept hypothesis 1 that there are significant differences in both FDI inflows and economic growth between the pre-IFRS and post-IFRS periods in Nigeria.

Also, the higher the Pillai's trace, the greater the significance and contribution of the given effect to the model. The Pillai's trace for IFRS adoption indicated .605, which was greater than that of regulatory quality and political stability. It implies that IFRS adoption plays a significant role in the model. Based on the results we can conclude that IFRS adoption and regulatory quality contribute to the movement of FDI flows as well as GDP. Wilk's lambda was significant (.395, $p = .001$) indicating a difference in the mean of both pre IFRS and post IFRS adoption periods, indicating that that IFRS adoption influences both FDI inflows and GDP levels.

Also, the results of the MANCOVA indicate that one of the covariates being regulatory quality is significant for both the pre and post IFRS adoption periods. The Pillai's trace for regulatory quality indicated at .571, which implies that this institutional quality indicator is significant in affecting the influence of pre-IFRS and post-IFRS on FDI inflows and GDP. Also, based on the MANCOVA analysis (Wilk's lambda .429, $p = .003$) there was a significant difference in regulatory quality between pre IFRS and post IFRS adoption periods. Among the covariates, regulatory quality was the only significant factor (.003) while political stability was not statistically significant. Though, with a Pillai's trace indicated at .196, political stability also is important to the model but with a lower impact.

Table 3 presents the tests between-subjects effects, which showed significant differences in GDP ($p = .002$) and FDI ($p = .001$) based on the mean values of 7.241 and .384 during the pre- and post-IFRS adoption periods. The MANCOVA analysis indicated that IFRS as the independent variable accounted for the movements in FDI and GDP at a significant level. Also, it contributed to the association between the two dependent variables. Regulatory quality has a contributing effect on both FDI with significance level of .042 and GDP significant at .009. Model 1 indicated an R square of .653 which implies that IFRS as the independent variable explains 65.3 percent movement in FDI. For Model 2, the R square of .709, indicated that IFRS adoption explains 70.9 percent of increase or decrease in GDP.

Also, for political stability according to table 3, there was a difference in FDI inflows and economic growth but not at a significant level. Hence, this implies that political stability was not significant influencing the impact of IFRS on FDI and GDP. This might be due to the fact that Nigeria as a whole

has not experienced political stability in recent years.

4.3. Mediating Analyses

To investigate hypotheses 2, 3 and 4, institutional quality indicators specifically regulatory quality and political stability as mediating variables. This examination focuses on the mediating effect of regulatory quality and political stability on the influence of IFRS adoption on FDI inflows and economic growth, using the methodology proposed by Baron and Kenny (1986).

Table 2. MANCOVA Computations

Effect	Statistics	Value	F-value	Sig.	Partial Eta Squared
IFRS	Pillai's Trace	.605	10.732	.001	.605
	Wilk's Lambda	.395	10.732	.001	.605
	Hotelling's Trace	1.533	10.732	.001	.605
	Roy's largest Root	1.533	10.732	.001	.605
RGQ	Pillai's Trace	.571	9.328	.003	.571
	Wilk's Lambda	.429	9.328	.003	.571
	Hotelling's Trace	1.333	9.328	.003	.571
	Roy's largest Root	1.333	9.328	.003	.571
PS	Pillai's Trace	.196	1.702	.218	.196
	Wilk's Lambda	.804	1.702	.218	.196
	Hotelling's Trace	.243	1.702	.218	.196
	Roy's largest Root	.243	1.702	.218	.196

Table 3. Tests of Between-Subjects Effects

Source	Dependent variables	df	Mean square	F	Sig.	Partial Eta square
IFRS	FDI	1	7.241	15.761	.001	.512
	GDP	1	.384	14.138	.002	.485
RGQ	FDI	1	2.283	4.969	.042	.249
	GDP	1	.249	9.150	.009	.379
PS	FDI	1	.247	.537	.475	.035
	GDP	1	.098	3.618	.077	.194
Model 1. R Square = .653						
Model 2. R square = .709						

Table 4. Mediating Analysis

Regulatory Quality as a mediating Factor				
Variables	FDI (without mediating var.)	FDI	GDP (without mediating var.)	GDP
IFRS	-1.493***	-1.330**	.235	.323***
RGQ		2.322**		1.250**
Political Stability as a mediating Factor				
Variables	FDI (without mediating var.)	FDI	GDP (without mediating var.)	GDP
IFRS	-1.493***	-1.330**	.235	.229**
PS		-.646		-1.173**

Note: ***, ** and * denote significant at 1% , 5% and 10% respectively].

Table 4 shows that with a figure of -1.493^{***} , IFRS adoption positively influences FDI inflows. As a result, we reject hypothesis 2 that there exists a positive influence of IFRS on FDI inflows, and accept that IFRS adoption negatively influences FDI. With the beta (-1.330^{**}) representing the relationship between IFRS and FDI being significant when regulatory quality (RGQ) mediates the relationship between the variables, it is concluded that the mediating effect is partial, indicating other mediators remain. Furthermore, table 4 shows that the effect of the adoption of IFRS is mediated by regulatory quality. Such that when regulatory quality is low in the country, it will influence IFRS to reduce FDI inflows and vice versa. However, with a figure of 2.333^{**} , we can infer that increase in RGQ enhances IFRS ability to attract FDI inflows. Political stability also proved to be significant in mediating the negative relationship between FDI and IFRS. However, with a figure of $-.646$, political stability weakens the promoting role of IFRS in attracting FDI. This can be linked to the political instability prevalent in Nigeria

With a figure of $.235$, the results from table 4 show that IFRS adoption positively influences Economic growth. Based on this we accept hypothesis 3 that IFRS adoption positively influences economic growth of Nigeria. Further, RGQ strengthens the benefits of IFRS in increasing economic growth based on the figure 1.250^{**} . While, with a figure of -1.173^{**} , political stability weakens the promoting role of IFRS in attracting economic growth. Furthermore, Table 4 indicates that regulatory quality and political stability are significant in influencing the effect of IFRS adoption on the increase in Nigerian economic growth. Based on table 4, we accept hypothesis 4 that the influence of IFRS adoption on FDI inflows and economic growth is mediated by institutional quality indicators in Nigeria

5. Discussion of Findings

MANCOVA analysis was utilized to examine the difference in FDI and economic growth between pre-IFRS and post-IFRS adoption periods while controlling for institutional factors. Based on the MANCOVA computations, the research findings discovered that economic growth and FDI inflows differed between preIFRS and post-IFRS adoption periods. During the postIFRS adoption period, Nigeria experienced increase in economic growth, while reduction in FDI inflows was noted. Economic growth was significantly impacted by the implementation of IFRS between 2012 and 2022, whereas prior to IFRS adoption, the Nigerian accounting standards had lesser increasing impact. The positive effect of IFRS adoption on economic growth in Nigeria may be attributable to increase in flow of domestic capital and funds between investors and business within the country fostered by the uniformity in preparation of financial statements.

The mediation analyses indicated that the negative influence of IFRS on FDI inflows in Nigeria is significantly influenced by institutional factors which are in line with the findings of Akpomi and Nnadi [55]. Institutional factors including regulatory quality and political stability were utilized as mediating variables of the model. The mediation results showed that both institutional variables are significant in determining the influence of IFRS on FDI inflows and economic growth. Specifically, with economic growth, findings indicated a positive influence of IFRS on GDP. The positive relationship found between IFRS on GDP proved to be positively mediated by regulatory quality. This implies that standardized regulations increase the positive effect of IFRS on Nigeria's economic growth. While, political stability was found to weaken the influence of IFRS adoption on economic growth. Also, the relationship between IFRS and FDI is positively mediated by regulatory quality. This suggests that legislation enforcement measures will increase the beneficial effect of IFRS on attracting in FDI inflows. While, political stability was found to weaken the influence of IFRS adoption FDI inflows.

. Based on the research findings of this study, FDI inflows have declined after the adoption of IFRS, contrary to expectations which are due to weak institutional quality.

6. Conclusions

IFRS has gained substantial significance and importance in the last two decades. As a result, the adoption of IFRS is being more widely used around the world. Nonetheless, differences in governance and institutional qualities will persist and have a significant effect on the interpretation and application of international standards in various countries. Despite the apparent benefits of IFRS adoption on economic growth, the results of this study provide evidence that the flow of foreign direct investment (FDI) into Nigeria after the adoption of IFRS is significantly influenced by institutional quality indicators. The findings also identified regulatory quality and political stability as important in influencing the impact of IFRS adoption on FDI inflows and economic growth. As such it is paramount that policies are made to ensure improved regulations and political stability alongside full IFRS adoption to boost reliability in the economy. Though IFRS promotes accounting accuracy, understandability, and reliability, its adoption tends to attract more FDI into countries with strong institutional structures including regulatory quality, political stability, rule of law and government effectiveness.

It is essential to acknowledge the limitations of this study. Firstly, FDI outflows are not considered in this analysis; only FDI inflows are examined. IFRS adoption and compliance also have an impact on FDI outflows through various channels. Therefore, future research should explore how IFRS adoption influences both FDI inflows and outflows. While this research focuses on Nigeria's economy, many African countries likely face similar challenges related to IFRS adoption, regulatory and its effects on economic variables. Consequently, further studies could involve a panel of African countries to assess how IFRS adoption affects not only the overall economy but also FDI inflows and outflows. Previous studies have primarily concentrated on the effects of IFRS adoption on either FDI flows or economic growth in isolation. This study advocates for a comprehensive approach that examines the influence of IFRS adoption on both FDI and economic growth to better understand its overall impact on the economy. Additionally, there are various mediators in the relationship between IFRS adoption and FDI inflows, as the mediators considered in this study are only partial mediators. To enhance the literature in relevant fields, future research should explore additional potential mediators.

7. Implications

This study suggests that legislation and enforcement mechanisms be designed to effectively regulate IFRS compliance. This could help enhance the positive impact of IFRS on attracting foreign direct investment (FDI) inflows. Independent regulatory bodies that will monitor and regularly inspect the preparation of financial statements to ensure adherence to IFRS requirements can be established to foster reliability and transparency. Adequate disclosures, corporate governance structures, and high institutional quality play an important role in determining the influence of IFRS adoption on FDI inflows and economic growth. Therefore, it is essential for internal control systems at the corporate level to be properly structured to ensure compliance with IFRS in the preparation of financial statements, accurately reflecting the company's earnings. Effective penalties should be implemented for inadequate disclosures to promote full adherence to IFRS. Moreover, the level of political stability in Nigeria has been found to undermine the positive effects of IFRS adoption on both FDI inflows and economic growth. Consequently, there is a need to encourage policies aimed at stabilizing the economy

and developing attractive tax incentives for investors. Additionally, standardized laws that promote transparency, along with the consistent implementation of IFRS irrespective of government changes and policies, should be established.

REFERENCES

- [1] Jinadu O., Ojeka S. A., Ogundana O. M., "IFRS adoption and foreign direct investment: Evidence from Nigerian quoted firms," *Mediterranean journal of social sciences*, vol. 7, no. 2, pp. 99-105, 2016. DOI: 10.5901/mjss.2016.v7n2p 99.
- [2] Simbi C., Arendse J. A., Khumalo S. A., "IFRS and FPI nexus: does the quality of the institutional framework matter for African countries?," *Journal of accounting in Emerging Economies*, vol. 13, no. 1, pp. 195-215, 2023. DOI: 10.1108/JAEE-10-2021-0319.
- [3] Bessler W., Gonenc H., Tinoco M. H., "Information asymmetry, agency costs, and payout policies: An international analysis of IFRS adoption and the global financial crisis," *Economic Systems*, vol. 43, no. 4, pp. 101129, 2023. DOI: 10.1016/j.ecosys.2023.101129.
- [4] Taiwo A., Olayemi S. O., "Re-examine foreign direct investment and economic growth: Panel co-integration and causality tests for sub-Saharan African countries," *International Area Studies Review*, vol. 18, no. 1, pp. 73-86, 2015. DOI: 10.1177/2233865914554469.
- [5] Uneze E., "The relation between capital formation and economic growth: evidence from sub-Saharan African countries," *Journal of Economic Policy Reform*, vol. 16, no. 3, pp. 272-286, 2013. DOI:10.1080/17487870.2013.79991 6.
- [6] Daske H., Gebhardt G., "International financial reporting standards and experts' perceptions of disclosure quality," *Abacus*, vol. 42, no. 3-4, pp. 461-498, 2006. DOI: 10.1111/j.1467-6281.2006.00211.x.
- [7] Wali Y., "Adoption of International Financial Reporting Standards (IFRS) In Nigeria: Prospects and Challenges," *International Journal of Entrepreneurship and Forensic Management Research*, vol. 1, no. 1, 2022.
- [8] Mameche Y., Masood, A., "Macroeconomic evidence on the impact of mandatory IFRS adoption on FDI in the Gulf Cooperation Council (GCC) countries," *Journal of Accounting in Emerging Economies*, vol. 11, no. 4, pp. 610631, 2021. DOI: 10.1108/JAEE-04-2020-0084.
- [9] Cieslik A., Hamza S., "Inward FDI, IFRS adoption and institutional quality: Insights from the MENA countries," *International Journal of Financial Studies*, vol. 10, no. 3, pp. 47, 2022. DOI: 10.3390/ijfs10030047.
- [10] Elhamma A., "Impact of mandatory IFRS adoption on foreign direct investment: the moderating role of conflict of interest regulation," *Journal of Financial Reporting and Accounting*, 2023. DOI: 10.1108/JFRA-04-2022-0145.
- [11] Owusu G. M., Suppiah S. D., Saat N. A., Law S. H., "IFRS adoption and economic growth in developing economies," *International Journal of Economics and Accounting*, vol. 11, no. 1, pp. 73-98, 2022. DOI: 10.1504/IJEA.2022.119613.
- [12] Ajibade A. T., Okeke O. C., Olurin, O. T., "International Financial Reporting Standard (IFRS) Adoption and Economic Growth: A Study of Nigeria and Kenya," *South Asian Journal of Social Studies and Economics*, vol. 3, no. 3, pp. 1-8, 2019. DOI: 10.9734/SAJSSE/2019/v3i330106.
- [13] Abdullaeva M., Hasan A. K., Yodgorova F., Khajieva I., Nusratova G., "The impact of IFRS adoption on economic growth in transition countries: Evidence from CIS," *Financial Internet Quarterly*, vol. 19, no. 2, pp. 1-17, 2023. DOI: 10.2478/fiqf-2023-0008.
- [14] Akisik O., Mangaliso M. P., "How IFRS influence the relationship between the types of FDI and economic growth: An empirical analysis on African countries," *Journal of Applied Accounting*

Research, vol. 21, no. 1, pp. 60-76, 2020. DOI: 10.1108/JAAR-02-2018-0025.

[15] Nnadi M., Soobaroyen T., "International financial reporting standards and foreign direct investment: The case of Africa," *Advances in accounting*, vol. 31, no. 2, pp. 228-238, 2015. DOI:10.1016/j.adiac.2015.09.007.

[16] Cualain G., Tawiah V., "Review of IFRS consequences in Europe: An enforcement perspective," *Cogent Business & Management*, vol. 10, no. 1, pp. 2148869, 2023.

[17] Asamoah M. E., Alagidede I. P., Adu F., "Exchange rate uncertainty and foreign direct investment in Africa: Does financial development matter?," *Review of Development Economics*, 2022. DOI: 10.1111/rode.12858

[18] Popescu G. H., "FDI and economic growth in Central and Eastern Europe," *Sustainability*, vol. 6, no. 11, pp. 81498163, 2014.

[19] Tsegba I. N., Moses I. D., Semberfan J., "International Financial Reporting Standards (IFRS) Adoption and Foreign Direct Investment (FDI) in Anglophone West African Countries: The Role of Institutional Qualities," In *10th International Conference of Accounting and Finance Research*, 2020.

[20] Aliabadi F. J., Shahri A. M., "Transparency in financial reporting with or without IFRS: the case of Iran," *World of Accounting science*, vol. 18, pp. 605, 2016.

[21] Barth M. E., "Research Standard Setting and Provisioning between IFRS and Prudential Guidelines," *Global Journal on Accounting and Finance*, vol. 12, no. 3, pp. 15-26, 2007. DOI: 10.1561/14000000002.

[22] Gordon L. A., Loeb M. P., Zhu W., "The impact of IFRS adoption on foreign direct investment," *Journal of accounting and public policy*, vol. 31, no. 4, pp. 374-398, 2012. DOI: 10.1016/j.jaccpubpol.2012.06.001

[23] Udofia I. E., "IFRS adoption and cross border investment in Nigeria," *Journal of Accounting and Management Information Systems*, vol. 17, no. 4, pp. 605-625, 2018.

[24] Leykun F. F., "IFRS adoption and foreign direct investment in Sub-Saharan African countries: Does the levels of Adoption Matter?," *Cogent Business & Management*, vol. 10, no. 1, pp. 2175441, 2023. DOI: 10.1080/23311975.2023.2175441.

[25] Silva A., Jorge S., Rodrigues L. L., "Enforcement and accounting quality in the context of IFRS: is there a gap in the literature?," *International Journal of Accounting & Information Management*, vol. 29, no. 3, pp. 345-367, 2021. DOI: 10.1108/IJAIM-08-2020-0126

[26] Abdul-Baki Z., Haniffa R., "The impact of accounting reform on accounting quality: evidence from Nigeria," *Journal of International Financial Management & Accounting*, vol. 31, no. 2, pp. 169-190, 2020. DOI: 10.1111/jifm.12112

[27] Cordazzo M., Rossi, P., "The influence of IFRS mandatory adoption on value relevance of intangible assets in Italy," *Journal of Applied Accounting Research*, vol. 21, no. 3, pp. 415-436, 2020.

[28] Odo J. O., "Adoption of IFRS in Nigeria: Challenges and the Way Forward," *International Journal of Academic Research in Business and Social Sciences*, vol. 8, no. 8, pp. 426-440, 2018. DOI: 10.6007/IJARBS/v8-i8/4493

[29] Ofoegbu N. G., Odoemelam N., "International financial reporting standards (IFRS) disclosure and performance of Nigeria listed companies," *Cogent business & management*, vol. 5, no. 1, pp. 1542967, 2018.

[30] Okpala K. E., "Adoption of IFRS and financial statements effects: The perceived implications on FDI and Nigeria economy," *Australian Journal of Business and Management Research*, vol. 2, no. 5, pp. 76-83, 2012.

[31] Herbert W. E., Tsegba, I. N., "Economic consequences of international financial reporting standards (IFRS) adoption: Evidence from a developing country," *European journal of Business and Management*, vol. 5, no. 28, pp. 80-99, 2013.

-
- [32] Ifeakachukwu N. P., Fagite B. A., "Macroeconomic Policy, Institutional Quality and Inclusive growth in Nigeria," *The Pakistan Development Review*, vol. 63, no. 1, pp. 89-100, 2024. DOI: 10.30541/v63i1pp.89-100
- [33] Hossein S. M., Yazdan G. F., "FDI and ICT effects on productivity growth in Middle East countries," *Journal of Economics and Sustainable Development*, vol. 3, no. 8, pp. 111-121, 2012.
- [34] Bertrand A., "Measuring foreign direct investment," *Statistics, Knowledge and Policy: Key Indicators to Inform Decision Making*, vol. 17, no. 7, pp. 597-618, 2005.
- [35] Begg D., Vernasca G., Fischer S., Dornbusch R., "Tools of economic analysis," in *Economics*, (11th ed.), M. H, 2014, pp. 22-34.
- [36] Nwaimo C. E., "Applied principles of economics (for students and professionals)". SP. 2009.
- [37] Trinh T. H., "A primer on GDP and economic growth," *International Journal of Economic Research*, vol. 14, no. 5, pp. 13-24, 2017.
- [38] Ciobanu A. M., "The impact of FDI on economic growth in case of Romania," *International journal of economics and finance*, vol. 12, no. 12, pp. 1-81, 2021. DOI: 10.5539/ijef.v12n12p81.
- [39] Uzawa H., "Optimum technical change in an aggregative model of economic growth," *International economic review*, vol. 6, no. 1, pp. 18-31, 1965. DOI: 10.2307/2525621.
- [40] Carkovic M., Levine R., "Does foreign direct investment accelerate economic growth," in *Does foreign direct investment promote development*, PIIIE, 2005, pp. 195.
- [41] Abubakar S., "Institutional quality and economic growth: Evidence from Nigeria," *African Journal of Economic Review*, vol. 8, no. 1, pp. 48-64, 2020.
- [42] Omoke P. C., Opuala–Charles S., "Trade openness and economic growth nexus: Exploring the role of institutional quality in Nigeria," *Cogent Economics & Finance*, vol. 9, no. 1, pp. 1868686, 2021. DOI: 10.1080/23322039.2020.1868686.
- [43] Lungu C. I., Caraiani C., Dascălu C., "The impact of IFRS adoption on foreign direct investments: Insights for emerging countries," *Accounting in Europe*, vol. 14, no. 3, pp. 331-357, 2017. DOI: 10.1080/17449480.2017.1374546.
- [44] Asheghian P., "Determinants of economic growth in the United States: The role of foreign direct investment," *The international trade journal*, vol. 18, no. 1, pp. 63-83, 2004.
- [45] Mattana P., "General properties of Uzawa-Lucas economy," in *The Uzawa-Lucas endogenous growth model*, (1st ed.), T.F.G, 2017, pp. 15-32. DOI: 10.4324/9781351144964.
- [46] Uzawa H., "Optimum technical change in an aggregative model of economic growth," *International economic review*, vol. 6, no. 1, pp. 18-31, 1965. DOI: 10.2307/2525621.
- [47] Larson R. K., Kenny S. Y., "Accounting standard-setting strategies and theories of economic development: implications for the adoption of international accounting standards". *Advances in International Accounting*, vol. 9, pp. 1-20, 2014.
- [48] Nkiwane P., Chipeta, C., "The performance of cross-border acquisitions targeting African firms," *Emerging Markets Review*, vol. 39, pp. 68-82, 2019. DOI: 10.1016/j.ememar.2019.03.004
- [49] Seyoum M., Wu R., Lin J., "Foreign direct investment and economic growth: The case of developing African economies". *Social Indicators Research*, vol. 122, pp. 45-64, 2015. DOI: 10.1007/s11205-014-0679-6
- [50] Ahearne A. G., Griever W. L., Warnock F. E., "Information costs and home bias: an analysis of US holdings of foreign equities," *Journal of international economics*, vol. 62, no. 2, pp. 313-336, 1996(03)00015-1 2004. <https://doi.org/10.1016/S0022>
- [51] Tarca A., "International convergence of accounting practices: Choosing between IAS and US GAAP," *Journal of International Financial Management & Accounting*, vol. 15, no. 1, pp. 60-91, 2004. DOI:10.1111/j.1467646X.2004.00102.x.
- [52] Owusu G. M., Saat N. A., Suppiah S. D., Siong H. L., "IFRS doption, institutional quality and
-

inflows: A dynamic panel analysis,” *Asian Journal of Business and Accounting*, vol. 10, no. 2, pp. 43-75, 2017.

[53] Shabbir M. S., Bashir M., Abbasi H. M., Yahya G., Abbasi B. A., “Effect of domestic and foreign private investment on economic growth of Pakistan,” *Transnational Corporations Review*, vol. 13, no. 4, pp. 437-449, 2021. DOI: 10.1080/19186444.2020.1858676

[54] Musah A., Adjei E., Ahmed I. A., “The effect of IFRS adoption on foreign direct investment in Africa,” *Journal of Applied Accounting and Taxation*, vol. 5, no. 2, pp. 117126, 2020.

[55] Akpomi M. E., Nnadi M. A., “The impact of International Financial Reporting Standards (IFRS) adoption on Foreign Direct Investments (FDI): Evidence from Africa and implications for managers of education,” *Journal of Accounting and Financial Management*, vol. 3, no. 2, pp. 51-65, 2017.

[56] Oppong C., Aga M., “Economic growth in European Union: does IFRS mandatory adoption matter?,” *International journal of emerging markets*, vol. 14, no. 5, pp. 792-808, 2019. DOI: 10.1108/IJOEM-01-2018-0010.

[57] Ugwu J. I., Okoye E. I., “Accounting for the effect of foreign direct investment on economic growth, post IFRS adoption in selected Sub-Saharan African countries (1999 2015),” *International Journal of Academic Research in Accounting, Finance and Management Sciences*, vol. 8, no. 2, pp. 73-94, 2018. DOI:10.6007/IJARAFMS/v8-i2/4184.

[58] Avwokeni A. J., “Adoption effect of IFRS on corporate social disclosure and gross domestic product: evidence from Nigeria,” *African Journal of Accounting, Auditing and Finance*, vol. 5, no. 3, pp. 254-269, 2016. DOI: 10.1504/AJAAF.2016.083722.

[59] Warne R. T., “Analysis of covariance,” *In Statistics for the social sciences: a general linear model approach*, C.U.P, 2000, pp. 282

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