JOURNAL OF APPLIED AND THEORETICAL SOCIAL SCIENCES

TEORİK VE UYGULAMALI SOSYAL BİLİMLER DERGİSİ

(e-ISSN: 2687-5861)

(DOI Prefix:10.37241/jatss)

International Peer-Reviewed and Open Access Electronic Journal
Uluslararası Hakemli ve Açık Erişimli Elektronik Dergi

VOLUME 6. ISSUE 1. 2024

CİLT 6. SAYI 1. 2024

PUBLISHER AND CHIEF EDITOR / SAHİBİ VE BAŞ EDİTÖR

PROF. DR. NİLGÜN SERİM

RESEARCHER-WRITER/ARAŞTIRMACI-YAZAR

Journal of Applied and Theoretical Social Sciences/Istanbul/ Turkey

editor.jatss@iccsor.com , nilgun.serim@iccsor.com

ASSISTANT EDITOR/ YARDIMCI EDİTÖR

AST.PROF.DR / DR. ÖĞRETİM ÜYESİ NAZMİ Y.YAĞANOĞLU

ÇANAKKALE ONSEKİZ MART UNIVERSITY

Biga Faculty of Economics and Administrative Sciences/Department of Econometrics/Çanakkale/Turkey/ **nazmiyagan@comu.edu.tr**

COMMUNICATION AND COORDINATION/İLETİŞİM VE KOORDİNASYON

https://www.iccsor.com/index.php/jatss

E-mail/ E-posta:

editor.jatss@iccsor.com

Ferah M. Nihat Sami Banarlı S. 32/ 8 Usküdar-Istanbul/Turkey

Ferah M. Nihat Sami Banarlı S. 32/ 8 Üsküdar, İstanbul, Türkiye

We are Indexed by the Following Databases / Endekslendiğimiz Veri Tabanları

EBSCOhost

Since 2021

EuroPub

Since 2021

ROAD DIRECTORY OF OPEN ACCESS SCHOLARLY RESOURCES

Since 2020

WorldCat®

Since 2020

CORE

Since 2021

BASE

Since 2021

Scilit

Since 2020

FATCAT

Since 2023

WIKIDATA

Since 2023

Member of:

Crossref

Since 2019

Archived by:

PKP PUBLIC KNOWLEDGE PROJECT

Since 2022

FIELD EDITORS/ ALAN EDİTÖRLERİ

EDITORIAL and ADVISORY BOARD/ YAYIN ve DANIŞMA KURULU

By Title In Alphabetical Order/ Ünvana Göre Alfabetik Sıra ile

Prof. Dr.	Neven ŠERİĆ	University of Spilit/Faculty of Economics, Business and Tourism/Department of Marketing/Split/Croatia	nseric@efst.hr
Prof. Dr.	Dixon Olutade TORIMIRO	The Obafemi Awolowo University/ Faculty of Agriculture/ Department of Agricultural Extension & Rural Development/ Ile-Ife, Osun State/ Nigeria	torimiro@gmail.com
Assoc.Prof.Dr.	Jakub BERCIK	Slovak University of Agriculture/ Faculty of Economics and Management/ the Department of Marketing and Trade/ Nitra/ Slovakia	bercik.jakubxx@gmail.com
Assoc.Prof.Dr.	Hasan DURAN	Istanbul University/Faculty of Political Sciences/Department of Political Science and International Relations/İstanbul/Turkey	hasan.duran@istanbul.edu.tr
Assoc.Prof.Dr.	Aleksander JANEŠ	University of Primorska/ Faculty of Management & Faculty of Polymer Technology/Koper/Slovenia	aleksander.janes.fm@gmail.com
Assoc.Prof.Dr.	Dushko JOSHESKI	University "Goce Delcev" at Stip, The Department of Business Administration/ Stip/North Macedonia	dushkojosheski@gmail.com
Assoc.Prof.Dr.	Adiqa KAUSAR KIANI	Federal Urdu University of Arts, Science & Technolog/Department of Economics/Islamabad/ Pakistan	adiqakian@gmail.com
Assoc.Prof.Dr.	Aroon P. MANOHARAN	Suffolk University/The Institute for Public Service (IPS)/ Sawyer Business School/Boston,/Massachusetts/ U.S.A	amanoharan@suffolk.edu
Assoc.Prof.Dr.	Jasmina MANGAFIC	University of Sarajevo/ The School of Economics and Business/Sarajevo/ Bosnia and Herzegovina	jasminamangafic111@gmail.com
Assoc.Prof.Dr.	Nelda MOUTON	North-West University, Business School, Operations Management / Supply Chain Management, North West / South Africa	nelda.mouton@nwu.ac.za
Assoc.Prof.Dr.	Edwin QUINN	Tennessee Wesleyan University/ Business Administration Program/ Athens, Tennessee/U.S.A.	ehq00@hotmail.com
Assoc.Prof.Dr.	Mesut SAVRUL	Çanakkale Onsekiz Mart University/Çanakkale Onsekiz Mart University/Biga Faculty of Economics and Administrative Sciences/Department of Econometrics/Çanakkale/Turkey	msavrul@comu.edu.tr
Assoc.Prof.Dr.	Alexander SHEMETEV	The Russian Presidential Academy of National Economy and Public Administration/ Moscow, Saint-Petersburg/Russia	anticrisis2010@mail.ru

Assoc.Prof.Dr.	Arunkumar SIVAKUMAR	VIT-AP University/ VIT School of Business/ Tamil Nadu/India	arunkumar.sivakumar@vitap.ac.in
Asst.Prof.Dr.	Verda Davaslıgil ATMACA	Çanakkale Onsekiz Mart University/Biga Faculty of Economics and Administrative Sciences/Department of Econometrics/Çanakkale/Turkey	verdaatmaca@comu.edu.tr

CONTENTS / İÇİNDEKİLER

Research Articles/Araştırma Makaleleri

Journal of Applied and Theoretical Social Sciences

JATSS, 2024; 6(1), 1-26

First Submission: 29.01.2024
Revised Submission After Review: 21.03.2024
Accepted For Publication: 30.03.2024
Available Online Since:31.03.2024

Research Article

Influence of Workplace Technology on Job Skill in selected Food and Beverage Firms in Lagos, Nigeria

Idowu Sulaimon Adeniyi [a]& Samuel Ayodeji Omolawal [b]

Abstract

This study investigated the influence of workplace technology on job skills among employees of the food and beverage industry in Lagos, Nigeria, using the Labour Process Theory. Data were collected through questionnaire administered to 447 respondents who are working at two food and beverage companies in Lagos and in-depth interviews with 8 Units' Heads. Burawoy's classification of technological levels into low, medium, and high was adopted. Quantitative data were analyzed using descriptive statistics and One-way ANOVA, while qualitative data were analyzed with content analysis. The results indicated that workplace technology had different influence on job skills across the three technological level units and was statistically significant in Firm A. Technological transition led to decreased job skills, particularly when moving from low-speed line to high-speed line and Information and Technology-support equipment. The evolution of food and beverage analyzers from manual to semi-automation and full-automation also decreased job skills. Workplace technology had negative influence on job skills in both Firm A and Firm B. Therefore, capacity-building programs should be implemented by enterprise owners to help workers adapt to the emerging challenges posed by workplace technology shaping the activities of firms. Organisations' management should ensure adequate human capital development for employees to adapt to the emerging technological trend and ensure proper use of the equipment adopted by organizations. Overall, developing one's skills is a solution to prevent technology from causing a decline in skills because people possessing creativity, inventiveness, imagination, innovation, and ambidexterity are not affected by technological advancements in the post-Fordist era.

Keywords: Workplace technology, job skills, capacity-building programs, food and beverage industry, Lagos

JEL Codes: M11,M12,C12

[a]Dr., University of Ibadan, Faculty of the Social Sciences, Department of Sociology, Ibadan/ Nigeria, adeniyidowu12@gmail.com, ORCID ID: https://orcid.org/0009-0005-6029-9504(Corresponding Author)

[b]Dr., University of Ibadan, Faculty of the Social Sciences, Department of Sociology, Ibadan/Nigeria, shomolawal@gmail.com, ORCID ID: https://orcid.org/0000-0002-8023-5306

Journal of Applied and Theoretical Social Sciences

JATSS, 2024; 6(1), 1-26

İlk Başvuru: 29.01.2024
Düzeltilmiş Makalenin Alınışı: 21.03.2024
Yayın İçin Kabul Tarihi:30.03.2024
Online Yayın Tarihi: 31.03.2024

Araştırma Makalesi

Lagos, Nijerya'daki seçilmiş Yiyecek ve İçecek Firmalarında İşyeri Teknolojisinin İş Becerisi Üzerindeki Etkisi

Idowu Sulaimon Adeniyi [a]& Samuel Ayodeji Omolawal [b]

Öz

Bu çalışma, İşgücü Süreci Teorisini kullanarak Lagos, Nijerya'daki yiyecek ve içecek endüstrisindeki çalışanlar arasında işyeri teknolojisinin iş becerileri üzerindeki etkisini araştırmıştır. Çalışmanın verileri, Lagos'taki iki yiyecek ve içecek şirketinde çalışan 447 katılımcıya uygulanan anket ve 38 Birim Başkanı ile yapılan derinlemesine görüşmeler yoluyla toplanmıştır. Çalışmada, Burawoy'un teknolojik seviyeleri düşük, orta ve yüksek olarak sınıflandırma modeli benimsenmiştir. Nicel veriler tanımlayıcı istatistikler ve Tek Yönlü ANOVA kullanılarak, nitel veriler ise içerik analiziyle analiz edilmiştir. Sonuçlar, işyeri teknolojisinin, üç teknolojik seviye birimi genelinde iş becerileri üzerinde farklı etkiye sahip olduğunu ve Firma A'da istatistiksel olarak anlamlı olduğunu göstermiştir. Teknolojik geçiş, özellikle düşük hızlı hattan yüksek hızlı hatta ve Bilgi ve Teknoloji destek ekipmanına geçerken iş becerilerinin azalmasına yol açmıştır. Yiyecek ve içecek analizörlerinin manuelden yarı otomasyona ve tam otomasyona doğru evrimi de iş becerilerini azaltmıştır. İşyeri teknolojisinin hem Firma A'da hem de Firma B'de iş becerileri üzerinde olumsuz etkisi olduğu gözlemlenmiştir. Bu nedenle, çalışanların, firmaların faaliyetlerini şekillendiren işyeri teknolojisinin ortaya çıkardığı zorluklara uyum sağlamasına yardımcı olmak için işletme sahipleri tarafından kapasite geliştirme programları uygulanmalıdır. Firmaların yönetimi, çalışanların ortaya çıkan teknolojik eğilime uyum sağlamaları ve kuruluşlar tarafından benimsenen ekipmanı uygun şekilde kullanmaları için yeterli insan sermayesi gelişimini sağlamalıdır. Sonuç olarak, çalışanların becerilerini geliştirmek, teknolojinin becerilerde düşüşe neden olmasını önlemenin bir çözümüdür çünkü yaratıcılığa, yaratıcılığa, hayal gücüne, yenilikçiliğe ve ikincil becerisine sahip insanlar post-Fordist çağdaki teknolojik gelişmelerden etkilenmemektedir.

Anahtar Kelimeler::işyeri teknolojisi, iş becerisi, kapasite geliştirme programları, yiyecek ve içecek endüstrisi, Lagos

JEL Kodları: M11,M12,C12

[a]Dr., University of Ibadan, Faculty of the Social Sciences, Department of Sociology, Ibadan/ Nigeria, adeniyidowu12@gmail.com, ORCID ID: https://orcid.org/0009-0005-6029-9504(Sorumlu Yazar)
[b]Dr., University of Ibadan, Faculty of the Social Sciences, Department of Sociology, Ibadan/Nigeria, shomolawal@gmail.com, ORCID ID: https://orcid.org/0000-0002-8023-5306

Introduction

Workplace technology, which involves using technological innovations to carry out job functions and optimize productivity and efficiency, has transformed work processes and bolstered organizational productivity on a global scale. In Nigeria's food and beverage industry, technology has brought innovations that have implications for job skills. Technological innovation has been driven by the necessity to find solutions to emerging challenges caused by population explosion (Forster, Hergeth, Naujoks, Krems & Keinath, 2020). Technology and workforce are the most critical factors that give a firm its distinctive character (Brauner, 1964). It is a catalyst that drives the economic growth and development of nations (Ajao, Umar, Khan, & Ali, 2021). However, despite the advancement in technology, it remains a means to an end and a tool devised to execute job functions, and not an end in itself.

The Marxian conceptualization of advanced technology resulting in increased loss of handicraft skills is central to the investigation of the influence of technological advances on work (Oriola, 2017). The modes of production of the capitalists usually break down the multifarious work procedures into slighter, easier, and ever-unskilled labor being automated (Braverman, 1974). There are two opposite perspectives regarding skills on the future of capitalist societies, which are positive and destructive (Gallie, 1978; Vallas, 1988; Heisig, 2017). The two perspectives of the future of work are closely associated with a corresponding, but opposing, optimistic or deleterious picture of the past regarding skills.

The supporters of deskilling and work degradation, according to Heisig (2017), believe that division of labor and mechanization of work markedly destroy the skills of artisans, craftsmen, serfs, foremen, and journeymen. On the other hand, the proponents of the Enskilling School of thought conceive uneducated and unskilled rural workers as the genesis of skill development under the capitalist modes of manufacturing. Heisig (2017) posits that both deskilling and upskilling perspectives are quite legitimate and can make credence to supportive evidence. Despite the stance that one holds, it cannot be denied that literacy and the general educational level of the population of industrialized nations have exponentially risen, and that the growing proportion of the population has become fully integrated into the realm of employment (Heisig, 2017). The Deskilling School of Thought is a Marxist School of Thought championed by Marx, Braverman, and their adherents, who unanimously discountenance the Enskilling position by adducing that the dawn of automation creates class structure between the management and the workers, which results in skill decline.

The International Standard Organization's Law 2005 (ISO 22000; 2005) states that the food and beverage industry should move from low technology to semi-automated technology to full automation technology to reduce contamination caused by human intervention in the production process. This law is usually implemented in collaboration with the Standard Organization of Nigeria (SON) to stimulate the transition of the industry from low technology to medium and high technology. As a result, a study was conducted to investigate the influence of workplace technology on job skills in selected firms in Lagos, Nigeria. The rise of industrial capitalism had a significant consequence, which was the destruction of handicraft skills. This was associated with the introduction of machinery and assembly-line processes. In the pre-Fordist era, employees such as serfs, craftsmen, peasants, foremen, artisans, and journeymen enjoyed considerable efficiency, autonomy, expertise, dexterity, work challenges, and work intrigues in planning, monitoring, and wage determination of their jobs. However, with the advent of Fordism, and following the pitfalls of Taylorism, the human factor was not taken into account. As a result, in the post-Fordist epoch, technology does the bulk of the tasks meant to be executed by employees. As tasks are increasingly automated in the workplace, the proportion

of employees goes by the pace and rhythms of equipment utilized, particularly in the production process, as work requires little input from workers since robots, digital platforms, and artificial intelligence carry out the bulk of the tasks. This is due to the fact that automated technology possesses certain features which are equal to those of human beings. Promoting digital literacy and social equity in education is a critical endeavour in our increasingly digital world (Eden, Chisom & Adeniyi, 2024).

Technological advances such as virtual reality, drones, augmented reality, numerically controlled machinery (NCM), hybrid zoom, Skype, digital zoom, Facebook, Bluetooth, Xender, Play Store, Messenger, Instagram, Microsoft Team, Mixlx, robots, machine learning, artificial intelligence, electric cars, driverless trucks, flying cars, Bluetooth, Ethernet, block chain, and nano-technology, define and dominate the current digital revolution. Given these advances, 30% of workers usually work with machines whose rhythms and cycles shape and determine their specific tasks and work pace. In Nigeria, the post-Fordist era is significantly transforming the nature of work due to technological advances and changing work requirements. With tasks becoming increasingly automated, jobs and skills are being lost, and other consequences of technological advances are causing employees to become deskilled, enskilled, and multi-skilled in their jobs. As the workplace becomes more automated, it becomes less challenging, less intriguing, and less self-fulfilling.

In Lagos, Nigeria, Firm A and Firm B employees in the food and beverage industry use computer-integrated manufacturing systems, programmable logical controls, IT support equipment, and automated food and beverage analyzers to complete tasks. This is in contrast to when tasks were done manually with low-speed lines, and manual food and beverage analyzers. With the bulk of tasks being done by technology-driven processes such as band dryers, extra tigatten, turbo bonal conveyor, K-bone, domino, and mojourner, employees are required to press buttons to perform their duties. This tends to make employees less proficient, especially in the production process.

Most studies on the influence of technology on work have focused on various sectors, such as printing, textile, automobile, auto-component, construction, banking, chemical, oil-refining, agriculture, and aviation. However, little or no attention has been paid to the influence of workplace technology on job skill in the food and beverage industry during the post-Fordist era. Additionally, studies relating to the influence of technology on job alienation and job satisfaction have been conducted in Nigeria, while the influence of workplace technology on job skill seems to have been neglected.

To address this gap, this study was designed to investigate the influence of workplace technology on job skill in selected firms in Lagos, Nigeria, and to identify the dominant trends among the deskilling, enskilling, and skill divergent tendencies. The researcher investigated the influence of technology on job skill in the study area to achieve the research objective.

Literature Review

Technology

Technology has been an integral part of human history, and research on how it affects job skills is ongoing. It remains a critical element that sets companies apart from each other. James Watt's invention of the steam engine in the 17th century was a significant milestone in the discussion of technology and work. The period from the Paleolithic era to the 18th century marked a time of significant technological advancement. The Neolithic era, in particular, sheds light on how technology developed during the Stone Age when humans used stones to make

fire. The steam engine, also known as the Bolton and Watt steam engine, was invented in 1775 and played a crucial role in the Industrial Revolution of the 16th century. Notably, this revolution gave rise to the field of Sociology. The second industrial revolution began with the development of electric generators and power plants in 1870. This led to the creation of the first modern moving assembly meat industry in Cincinnati and Chicago. In 1913, Henry Ford invented the Belt Conveyor for the moving assembly in the vehicle industry, which led to the mass production of Model-T automobiles and a sharp decline in automobile prices. During this time, there was a division between cerebral and physical labor. Management was responsible for work planning, while shop floor employees were responsible for carrying out work execution. This led to the introduction of a hierarchical organizational structure, which increased productivity and effectiveness at work. Business owners also utilized robots to carry out job functions, further optimizing efficiency and effectiveness in the workplace.

Technology and Job Skill

To illustrate the importance of skill in studying the impact of workplace technology on work, it has been found that as workplaces become more automated, work becomes less challenging, less demanding, less intriguing, and less autonomous (Vallas, 1988). Skill is defined by Braverman (1974) as the ability of workers to conceive and complete complex tasks in a self-directed and autonomous manner. Edgell and Granter (2019) argue that expertise is achieved when a worker focuses on a small part of the production process, which leads to specialization of work and the development of skills. Smith (1776) defines dexterity as the ability to execute job functions independently, which is achieved by specializing in the production of one thing. However, despite the benefits of utilizing tools and technology, Smith (1776) argues that it ultimately leads to a dissatisfied workforce due to the mundane and routine work processes that can cause boredom and monotony. Marx (1844) believes that the division between skilled and unskilled workers is the basis for class structures, and the separation of hand and mental work leads to a decline in knowledge and intelligence. Marx argues that the fragmentation of the labor process reduces a worker's ability and pride in their work, as it leads to the loss of comprehensive and integrated knowledge about craftsmanship.

Marx argues that skill is the basis for class distinctions between the management and workers. This idea suggests that the capitalist system's class structure is a result of skill. Braverman's thesis builds on this idea by stating that the division of labour into less skilled workers leads to the elimination of handicraft talent. He argues that as work processes are divided and tasks are mechanized, skills are lost. Braverman points out that there is a significant difference between the conception of work and its execution.

Technology and Deskilling

Technological advancements have led to the deskilling of various working-class jobs (Thompson & Smith, 2009). The rise of industrial capitalism has resulted in the destruction of skill due to the adoption of machinery and assembly-line processes (Foster, 2010). Braverman's thesis on deskilling has ignited a labour process debate among scholars, leading to a prolonged bout of Bravermaniac interpretations of work as broken down and mechanised in capitalist societies, resulting in decreased worker skill levels (Edgell & Granter, 2019). Workplace technology engenders skill decline as technological advancements have been shown to change the required nature of work contents in workplaces (Thompson & Smith, 2009).

It is important to note that the belief that technology results in skill decline creates a class structure known as proletarianisation, which can be compared to occupational downgrading. This is regarded as techno-pessimism, which suggests that the dichotomy

between manual and mental tasks being mechanised ultimately destroys handcraft skills. Scholars have been grappling with how technology erodes workers' skill levels. Academic literature has established that Marx in 1844 was the historical antecedent of the influence of technology on workers. Marx describes the social relations that characterise the entrepreneurial system of the economy, which swallow the knowledge and intelligence of workers by breaking down the entire work into smaller, simpler tasks and mechanising them, thus preventing workers from imaginatively fabricating the products of their own hands. Marx particularly criticises the division of mental and hand tasks, which he describes as limiting the dexterity of workers. Burawoy (1985) argues that social relations in capitalist modes of production can be understood in terms of interactions between business owners and workers in the production process. Marx's main argument is that as work becomes more broken down and mechanised, the knowledge and intelligence of the workers diminish astronomically.

Technology and Enskilling

The principal relevance of the subject matter of enskilling to this paper lies primarily in the notion that there are two sides of a coin to any phenomenon. The whole concept of enskilling came about in reaction to the Marxian conceptualisation of advanced technology resulting in losses of knowledge and intelligence. The notion of enskilling is otherwise known as occupational upgrading which is at the same time regarded as techno-optimism and which essentially connotes a scenario whereby the upgrading of technology results in skill rise that removes the drudgeries of work which by extension results in a class structure known as professionalisation.

It is expedient to note that Robert Blauner is regarded as the most prominent proponent of the concept of enskilling. Blauner carried out an empirical study in four different industries; these are printing, textile, automobile and chemical industries. It is worth stating that his book essentially focuses on the attitudinal study of job dissatisfaction of employees. Blauner (1964) asserts that employees in printing and chemical industries enjoyed considerable autonomy by virtue of their skill in work exertion more than their counterparts in textile and automobile industries. He discloses that employees in printing and chemical industries did not switch allegiance from one firm to another given that they derived fulfilment in exerting their skills, whereby the management did not call the shots for them as it was really the case for their counterparts in assembly plants and textile industry.

Methodology

This study was conducted in Lagos State, Nigeria. Lagos State is the nucleus of industrial activities in Nigeria. It has the highest number of food and beverage firms in Nigeria (Ene-Obong & Sanusi, 2020). The basis for choosing the food and beverage industry is that it is viewed as the second to the largest industry in Nigeria and it is critical to expanding economic prospects (Babajide, 2010). Ethics Committee Permission obligation has been introduced in every interview techniques conducted after 2020. However, since this study was conducted before 2020, ethics committee approval was not obtained. The study was genuinely carried-out in 2018/2019. Firm A was selected because it is the biggest food and beverage company in the universe measured by revenue, diversity, value-adding and per capita income while Firm B was chosen because it is a biggest indigenous conglomerate when it comes to brewing alcoholic and non-alcoholic beverage in Nigeria. The two firms are manufacturing companies that deploy technologies to manufacture commodities; they recruit workers for the manufacturing of goods; they are well-known firms and they have numerous units which vary considerably in terms of job functions. Firm A signifies Societe Anonyme which indicates corporation being organised and it exists under the laws of Switzerland and having its registered office situated in Vevey,

Canton of Vaud, Switzerland and its permitted successors and assigns (Global Negotiator 2014). Firm B has a rich portfolio. Since the establishment of Firm B in 1946, it has become the nation's flagship brand and the Nation's number 1 Beer that was Star Lager Beer in 1949 which has exponentially expanded its Lager portfolio and introduced an unmatched range of Non-Alcoholic, Stout, and Spirit Drinks.

The study design is explanatory, both quantitative and qualitative techniques of study were adopted. Technology was classified into low, medium and high levels. Bowoy's (1985) model of classification of technological levels into low, medium and high was adopted. Data were elicited from a sample size of 447 employees involved in questionnaire administration. The study employed Taro Yamane's formula from 1967 to determine the sample size. The hypothesis was formulated in the null form, stating that there is no significant difference in job skill between the selected firms in relation to their workplace technology. The study involved 38 Unit Heads, one from each unit of both firms, who participated in qualitative research through in-depth interviews (IDIs). The study sample was selected from the lists of permanent staff obtained from each of the two firms covered.

The process of analyzing qualitative data obtained from study participants involved several steps. Firstly, a clear research question and objective were established to guide the analysis process. Next, sampling was done to determine the sample size and selection criteria for the data that was analyzed. The data was then gathered through in-depth interviews with unit heads across the selected firms. The data was prepared by organizing and transcribing the interviews. After this, the coding process began. A code scheme was developed, and different segments of data were systematically categorized and labelled according to themes, concepts, and patterns. Each piece of data was assigned relevant codes. The coded data was then analyzed to identify patterns, themes, and interconnectedness among variables. Techniques such as regular comparison, thematic analysis, and narrative analysis were used for this purpose.

The findings were then interpreted rigorously within the context of the research objectives, taking into account the implications and meanings of the identified patterns and themes. The findings were validated through techniques such as member checking, peer debriefing, or triangulation to ensure the validity, reliability, and credibility of the analysis. Finally, the results were disseminated through a written report. The presentation of the findings was done logically and coherently and serves as supporting evidence from the data analysis. This process ultimately leads to new insights emerging from the study.

A total of 18 In-depth interviews (IDIs) were conducted with the Unit Heads of Firm A whereas 20 IDIs were conducted with the Unit Heads of Firm B. The first stage: Nigeria was stratified into 10 industries thereby food and beverage industry was chosen. The rationale behind its selection is that the food and beverage industry is central to human health (Pfizer, 2007). It is unique in expanding economic opportunities and it is almost the largest sector in the Manufacturing Association of Nigeria (MAN) which includes primary sector and secondary sector (Babajide, 2010). The second stage: Nigeria was stratified into six geo-political zones and the South-west was purposively chosen. The rationale behind its selection is that the South-west has forty food and beverage firms out of the 79 firms in Nigeria (Jawando & Adenugba, 2014). From South-west, Lagos was purposively chosen owing that it is the industrial hub of Nigeria and it has the highest number of food and beverage firms in Nigeria (Ene-Obong & Sanusi, 2020). The third stage: Food and beverage industry in Nigeria was stratified into 79 firms thereby Firm A and Firm B were purposively chosen. The justifications for the selections of the two firms are based on the fact that the former is the largest Food and Beverage Company in the whole world (Sorvino, 2022) and the latter is the pioneer and the biggest indigenous

alcoholic and non-alcoholic company in Nigeria (Reutr, 2021). Finally, the fourth stage: The employees in the selected firms were selected through random sampling.

A total of 255 copies of questionnaire were retrieved from respondents in Firm A while 142 copies were collected from the respondents in Firm B. Out of the 397 questionnaires received, the copies that were retrieved indicated an 88.8% response rate. The data collected through a structured questionnaire were analyzed using the Statistical Package for Social Sciences (SPSS) (version 24) using tables, frequencies, and percentages. One-way analysis of variance (ANOVA) of independent measures was performed to investigate the impact of the independent variable on the dependent variable (job skill). The study made use of labor process theory, which offered theoretical justifications for how an employee is materialized in terms of planning, execution, control, skills, and wages for labor articulated in a capitalist economy (Marx, 1844) and objectified in terms of use value.

Responses that were generated through the questionnaires which were administered to the workers in the two firms were analysed with the aid of the Statistical Package for the Social Sciences (SPSS). For the avoidance of obscurity, this was done in three different levels which included Univariate analyses of the socio-demographic characteristics of the respondents and bivariate analysis of independent and dependent variables. This covered such areas as age, marital status, religion, educational backgrounds, take-home income, work experience, cadres, and ethnic backgrounds of respondents given the diverse heterogeneous nature of Lagos State where the research was carried out. In similar vein, at the bivariate analysis level, descriptive statistics, One-way ANOVA was used to show influence of the independent variable (technology) on dependent variable (job skill).

It is worthy of affirming that to test the influence of technology on average job skill Analysis of Variance (ANOVA) was carried out. Besides, comparisons of the differences in the means of job skill were done to establish the exact technological level across the units of the firms that accounted for the statistical significance. Both firms granted ethical approvals; Firm B gave a similar ethical approval with reference number H-Rewards/20223/003, while Firm A gave its permission with reference number HRD/SL/IE/AFF. The researcher worked assiduously to make sure that the rights to privacy and the ethical use of data were rigorously followed. This study was conducted in an open and unbiased manner.

Job Skills

The skill variable was measured using a Likert scale consisting of items such as autonomy, knowledge, dexterity, expertise, ability, competence, capability, coordinating capacity, ingenuity, understanding, confidence, prowess, acumen, work challenges, discretion, work intrigues, judgment, and clear idea. Each item was scored on a scale of 1 to 5, with 1 being "very low" and 5 being "very high". Section 1 of Appendix I contains the questions asked about job skill from respondents in both firms. A composite score was derived by adding up the total number of items used and dividing it by 2. The table containing the reliability measures of job skill can be found in the Appendix section of the manuscript.

Reliability Test of Job Skill

The items used in this study were obtained from the works of Gallie (1978), Lee (1981), Vallas (1988), and Spencer (1990). These items were subjected to a reliability test, and those that did not contribute much to the reliability of the scale were eliminated if their Cronbach's Alpha coefficient values were lower than .70. This is because .70 and .60 were considered reliable based on the principle of Cronbach's Alpha.

After summing up the composite scores of the variable items, the data were aggregated to the unit levels. The composite scores of the individuals' data were then aggregated to the unit level. The average percentage of job skill was also aggregated to unit levels rather than individual levels. The reason behind this data aggregation was that the technological levels were at the unit/departmental levels, and units were the focus of the study. Technology was rated as low, medium, or high, so it was essential to examine the variations of the average of job skill across the technological levels. The combination of these variable items gave rise to how the variable of skill was derived. In this respect, a one-way analysis of variance was used because it is a comparative test of the effect of an independent variable on dependent variables.

Results and Discussion

Brief Social and Demographic Characteristics of Respondents

Regarding the age of the respondents, it was found that in Firm A, the minimum age was 21 years old, and the maximum age was 57 years old. In contrast, it was found that in Firm B, the minimum age was 20 years old, and the maximum age was 48 years old. It was also discovered that respondents' average age in Firm A was 32.20, whereas respondents' average age in Firm B was 32.61. For respondents in Firm A, the age standard deviation was 5.689, but for respondents in Firm B, it was 5.028. The preponderance of the employees in both firms was relatively young. On the educational qualifications of respondents when they were being recruited were investigated and the findings indicated that the majority of the respondents (76.1%) and (73.8%) from Firm A and Firm B respectively had tertiary educational qualifications when they were recruited. From the same table, further educational attainments of the respondents after recruitments were investigated and the result depicted that the majority of the respondents in Firm A were (56.0%) and the respondents in Firm B, (56.0%) indicated that further educational attainment after recruitment did not apply to them while (29.3%) and (39.0%) had further educational attainments.

Note: 'N' indicates the total number of the units in each firm while 'n' depicts the number of the units with low, medium and high technological levels in each firm.

Table 1

The Extent of Influence of Technology on Job Skill in Firm A and Firm B

	Firms						
	Firm A (1866) (n=18 units)			Firm B (1946) (n=20 units)			
	Tech levels				**Tech levels**		
	Low		Medium	High	Low	Medium	High
	Variables	(n=2)11.1%	(n=11)61.1%	(n=3)27.8%	(n=4)20.0%	(n=13)65.0%	(n=3)15.0%
	job skill	66.75	67.81	60.30	65.69	69.54	73.00
	f-ratio	3.96			1.31		
	Df	2/15			2/17		
	p-value	0.04					
	comparison test						
		1	**2**	**3**			
1	low tech	-					
2	medium tech	-1.056	-				
3	high tech	6.448	7.504*				

Note. Researcher's Computation

Table 1 above presents the extent of influence of technology on job skill in selected firms. In an attempt to examine the influence of technology on job skill across the three levels of technology, a one-way analysis of variance (ANOVA) was used to test influence of technology on job skill. It is essential to note that the units in the selected firms were more technologically-inclined than others. Having classified the units across both firms in terms of low, medium and high technological level units, influence of workplace technology on job skill was examined which was revealed that it varied considerably across the units of both firms. This was done by testing the mean values of job skill. The variations in the mean values of job skill across the three technological levels appositely signify that workplace technology differently influenced job skill. As depicted explicitly in the table 1, the mean values of job skills (66.75, 67.81 and 60.30) across the three levels of technology varied considerably in the two firms examined.

ANOVA is a statistical tool that is best suited to analyze the influence of technology on job skills, especially when technology is measured in terms of low, medium, and high. If there are variations in the three mean values, this indicates that there is an influence. On the other hand, if the mean values in the three technological levels are the same, we can confidently conclude that there is no influence. ANOVA is an inferential statistical technique that its Honest Significant Difference (HSD) indicates that the differences in the three mean values suggest that influence of technology on job skill can be inferred.

The mean values of job skill across the three technological levels varied considerably. The variations in the mean values of job skill across the three levels of technology indicated that technology truly influenced job skills. In the case of the uniformity of the mean values of job skill across the three levels of technology, it would be revealed that technology did not influence job skill. Hence, the differences in the mean values of job skill, (66.75, 67.81 and 60.30) were found to be statistically significant at p=0.04 and that implied that technology had influence on job skill. The result aptly mirrors the view of Edgell and Granter (2019) who

posited that one of the aftermaths of the rise of industrial capitalism was destruction of skills associated with the advent of machinery and the assembly-line process.

In contrast to statistical outcome, the qualitative result from Culinary Unit Manager revealed that:

> In Culinary plant, the transition of technological innovations from manual technology and very low speed line equipment to semi-automated equipment and to highly automated equipment, IT-support equipment, logical programmable control equipment and very high speed lines being utilised in pressing and wrapping operations (1,500 cubes of Maggi per minute) has exponentially paved ways for employees with requisite training in different fields of Engineering such as Electrical, Mechanical, Automation, Instrumentation, Chemical Engineering, Robotic Engineering, Mechatronics, Digital platforms and Artificial Intelligence, such that employees in the aforementioned unit enjoy considerable autonomy, particularly those who possessed professional certifications in such disciplines, enjoy exertion of considerable expertise. These innovations have resulted in massive competence requirements which have increased as more personnel are able to operate and maintain the equipment they utilise, to a large extent. **(IDI/Firm1/CM/May, 201**

The study revealed that average job skill in the medium level of technology had the highest mean value (67.81). This showed that in Firm A, employees in medium f technological level possessed higher job skills than their counterparts in low and high technological level units. This is because the job functions executed by the workers entailed both manual and mechanical procedures. The finding contradicts the stance of Blauner (1964), who affirmed that operatives in assembly plant did not enjoy autonomy like their counterparts in printing and oil-refining industries.

It was demonstrated that the mean work skill value (66.75) in the low technological units had a higher job skill mean value than their high level of technology units, in contrast to the mean job skill value (67.81) in the medium technological units. This suggests that although employees in high technical units had greater skills than those in low technological units, workers in low technological units were less autonomous than their counterparts in medium-level technological units. The mean job skill value (60.30) in the high technical units comes next. Considering the advances in technology that they employed, this suggests that the workers in high technological units were less skilled (60.30) than their counterparts in both low (66.75) and medium-level technical units (67.81). This is because the equipment deployed such as Band Dryer, extra Tigathen, Turbo Bonal Conveyor and Computer-integrated Manufacturing System were controlled through symbolic and digital processes in that the operators' efforts and energy were not immediately because virtually everything was automated. This subjected them to pressing buttons routinely in factory system. Considering that the high technological units had the lowest mean job skill (60.30), the employees in high technological units were most predisposed to influence of the technology they utilised.

In view of the result of analysis which signifies that the average job skill varied considerably across the three levels of technology, it became imperative to observe whether the variations in the mean values of average job skill across the three technological level units are statistically significant or not. In this wise, the result depicted that the variations in the mean values of average job skill across the three levels of technology in Firm A were found to be statistically significant at (F=3.96, df=2/15 and p=0.04). The differences in the mean values in three technological levels were discovered to be statistically significant. It could be inferred

from this result, that, the statistical significance of the variations in the mean values of average job skill across the three levels of technology, revealed that technology had undesirable influence on average job skill in Firm A, which in turn suggests that technology deskills workers. The cardinal factor responsible for the statistical significance of the extent of influence of technology on job skill in Firm A can be attributed to the lowest mean of job skill (60.30) found in high technological level units. The finding corresponds with the submission of Braverman (1974), who posits that technology progressively deskilled employees in capitalist modes of production. It echoes the view of Edgell and Granter (2019), who posit that one of the consequences of the rise of industrial capitalism was the destruction of skills that was ascribed to the adoption of machinery and assembly-line process.

To reinforce the statistical result, an IDI conducted with the Production Unit's Head reveals thus:

> When utilising Oven System, Tigathen and Belt Conveyor in this unit, the unit had a sizable number of employees saddled with tasks to execute. They enjoyed considerable skill exertion in discharging their duties. Nevertheless, migrating to Band Dryer, extra Tigathen, Turbo Bonal Conveyor and Computer Integrated Manufacturing System in producing Milo Tea and Nido, has drastically changed the significant nature of work, owing that about twenty employees who used to be allotted to the Production Unit have been radically reduced to five employees monitoring the smooth-running of automated machines. In the light of work automation, work in this unit exclusively belongs to the machine autonomous and programmers who call the shots on their jobs as they do the jobs which are not relevant for the rank and file in the unit. **(IDI/Firm1/PM/May, 2019).**

In the same vein, another Unit Head from the Quality Assurance Unit affirmed thus:

> When the employees in Quality Assurance Unit were using manual beverage analyser and manual food analyser to evaluate both raw materials and finished commodities, they enjoyed considerable autonomy in terms of exerting skills to get tasks executed. However, the revolution of technology from manual beverage analyser to semi-automated beverage analyser, and finally, to fully automated beverage analyser and the transition from manual food analyser to semi-automated food analyser and finally, to automated food analyser, has altered the ultimate landscape of the Unit, thereby the employees who are used to exertion of skills, currently press buttons monotonously in carrying out the job duties which immensely limits the amount of skill inputs on the part of employees, since the bulk of work is automated. **(IDI/Firm1/QA/May, 2019).**

The result lends credence to the standpoint of Braverman (1975), who contests that people's relationship with nature is not necessarily one of food-gathering or shelter-seeking in the crevices provided for them, ready-made by nature. Braverman (1975) further stresses that humanity takes the numerous materials bestowed by nature and alters them into various objects which are more beneficial to the mankind. Following the position of Braverman (1975), humanity works to live and to provide for itself the means and provisions of life. He postulates that if individuals often complain about work as a constraint being laid upon the species by nature, it is evident that work as a species' feature is natural to human life, as hunting and grazing are to other species.

In contrast, an In-depth interview which was conducted with an HR Manager revealed thus:

When the HR unit was using Automatic Data Processor for the database of employees, they lacked considerable autonomy in making some amendments in terms of misspelled names, residential addresses and account numbers, such that they needed to lodge numerous complaints directly to the HR Unit. When the unit migrated from Automatic Data Processor to Hire-to-Retire Module, they began to enjoy considerable autonomy in terms of effecting certain corrections when their names are misspelled, and particularly when they have issues with their bank accounts. (IDI/Firm1/HRM/May, 2019).

The result validates the stance of Meyer et al, (1999), who contends that in Ford Highland Automobile Plant, the production of Model T vehicles was initially concentrated in the hands of craft men and artisans. Even so, having got to see that their efforts stiffening the pace of production, he resorted to adopting Belt Conveyor, which rendered such employees redundant? Against this backdrop, work degradation arose from the deployment of belt conveyor which rendered the craft men dispensable. The result is in accord with the view of Edwards (1979), who posits that on account of the capitalists adopting impersonal technology like a stopwatch, which determined the pace and rhythms of work such that there was no breathing space for employees. His work typically encapsulates the conflict which ensues between capital and labour in the workplace and the systems of control being designed by enterprise owners to contain it, particularly in America.

Another IDI which was conducted with a unit head from IT Unit goes thus:

Technology is an innovation that changes the ways people do things. As it evolves, people must adapt to it by developing new skills. Technology needs to evolve to cater the emerging populations of the world. Old skills may not be apt to man a new technology as it might have become outmoded. The best bet is to synchronise with technological trends. People who fail to align with technological advances inexorably miss the benefits and convenience in technology. (IDI/Firm1/ITM/May, 2019).

The insight substantiates the perspective of Bawalla (2020), who affirms that technology is exponentially reshaping the skills required for work, in that the demand for less advanced skills that can be replaced by technology is gradually reducing or has drastically declined. He stresses that although the demand for advanced cognitive skills, socio-behavioural skills and skill combinations associated with greater adaptability is fast rising at an exponential rate. The finding substantiates the submission of Omolawal (2018), who avows that the utilisation of technology is pertinent when it comes to the quality of staff recruitment in a given organisation owing that it was found to facilitate the recruitment of job applicants who were technology-savvy. He maintains that the employees who were recruited were already capable of multi-tasking and multi-skilling. According to Omolawal (2018), the utilisation of technology in staff recruitment eased the recruitment of employees who already possessed better exposure of global world which would immensely enhance their performance in workplace.

Sequel to Labour Process Theory, the emergence of technology, in actual sense, has eroded the skills of clerical personnel, assembly-line engineers, traditional drivers and drummers. Given the effect of technology on job skills, Belcher (2014), posits that the only two professions which are immune from technological advancement are teaching and administrative professions. Both parents and their off-springs usually have desktops, laptops, routers and internet facilities at their households, which students utilise in relating with their teachers and supervisors while seeking insights on their home-work. The finding supports the view of Burawoy (2000), who asserts that in the Shipyard of San Francisco, skilled workers were

deskilled to cut the costs of production and enhance productivity (Blum, 2000). Hence, skilled workers were replaced with unskilled workers.

Comparison Test of Job Skill across the Three Groups of Technology in Firm A

Having established that the differences in the mean values of job skill across the three levels of technology in the units of Firm A, were found to be statistically significant at p=0.04, it became imperative to investigate the exact mean value out of the three mean job skill across the technological level units. The finding showed that the mean job skills of both high and medium technological levels accounted for the statistical significance of the influence of technology on job skill which is the figure being asterisked herein (7.504*). This indicates that the mean values of job skills of high and medium technological levels contributed to the statistical significance of technology and job skill in Firm A.

The Extent of Influence of Technology on Job Skill in Firm B

Contrary to the finding which was gathered from Firm A, in the case of Firm B, the finding revealed that high technological units had the highest mean (73.00) of job skill across the three levels of technology. Deductively, this indicates that the workers in high technological level units (65.69, 69.54 and 73.00) were more dexterous than their counterparts working in both medium and low technological level units. This trend negates the position of Braverman and his followers who unanimously contend that advanced technology results in skill decline which results in a class structure called the proletariat. The argument unanimously advanced by the deskilling theorists is that, the more technology advances, the lesser the skills that workers possess. As far as the findings gathered from the study in Firm B. is concerned, it discountenances the position of the deskilling theorists who unanimously posit that the higher the level of technology, the lower the skill level of workers. It then suggests that although this is a fourth industrial revolution, workers possessed high skills at a high technological level, in spite of technological advancement. The implication of this is that workers in high technological level units enjoyed considerable autonomy and expertise in carrying out their tasks. What ultimately accounted for the variations in the mean job skill (65.69, 69.54 and 73.00) can be ascribed to the fact that the units across the firm were more technologically intensive than others which differentially influenced job skills.

This indicates that given the equipment deployed in Firm B, the employees in high technological level units (65.69, 9.54 and 73.00) were more dexterous than their counterparts in both low and medium technological level units. It is vital to note that the finding revealed that the next mean value on the skill index in regards to Firm B. is concerned about the job skill in medium technological level units. This invariably indicates that workers in medium technological level units possessed lesser skill than their counterparts in high technological level units, but higher in skill level than their counterparts in low technological level units in carrying out their job functions. In this wise, it is worthy of observing that workers in medium technological level units were not as autonomous as those workers in high technology. This pattern of relationship between technology and job skill simply aligns with the perspective of Amber and Amber (1962), who assert that the removal of the initiative of operators is quite central to the medium technological level units. Equally, this trend falls short of the positions of (Blauner, 1964, Bell, 1973; Berg et al., 1987 and Hull et al., 1982), who unanimously contend that medium technological level industries affect the job skill most due to the fragmentation, standardisation, rationalisation and routinisation of factory settings that dictate the pace and the rhythms of the production processes.

In respect of the of mean of job skill in the low technological level units, the finding revealed that the low technological level units had the lowest mean value (65.69, 69.54 and 73.00) which symbolises that the workers in low technological level units possessed low job skill. The variations in the findings in the low technologically level units from both firms (Firm

A: 66.75, 67.81 and 60.30 while Firm B: 65.69, 69.54 and 73.00) can be justified by the variations in their modes of manufacturing of the end-products which differently influenced job skills**.** It is overwhelmingly lucid that when a technology is in its crudest form, it is natural that the operators would enjoy considerable dexterity in manning it. In other words, such workers would enjoy considerable proficiency in utilising such equipment owing that they are quite at liberty to manipulate them as they desire. Glaringly, this epitomises the oldest form of the equipment utilised in the craft and guild era when the farmers, craft men and artisans were carrying out their activities in terms of cultivation of the land with the aid of cutlasses and hoes as well as building canoes.

Contrary to the statistical significance of technology on average job skill across the three levels of technology in Firm A, the finding gathered from Firm B revealed that the differences in the mean job skill across the three levels of technology are not statistically significant at (F=1.31, df=2/17 and p=0.2). From the result, it can be deduced that technology did not influence job skill in Firm B. In other words, this indicates that technology had no influence on job skill in Firm B given that the variations across the three technological level units were not statistically significant at p=0.2 in Firm B. Inferentially; it technically indicates that technology did not deskill workers across the three technological level units as far as Firm B is concerned. The chief causal factor responsible for the statistical insignificance in Firm B can be ascribed to the highest mean job skill (73.00) discovered in high technological level units. The finding corroborates the view of Edgell and Granter (2019), that the central workers in the post-Fordist epoch are professionals who are rooted in education and training, to provide the type of skills that are increasingly demanded in the post-Fordist societies. The finding equally lends credence to the viewpoint of Zuboff (1988), who affirms that an operator of any particular equipment in the post-industrial society automatically becomes the operator if he knows his onions rather than the machine controlling him.

The finding aligns with the viewpoint of Bell (1973), who affirms that the centrality of knowledge and the growth of technical specialty will be the hallmarks of post-industrial society having transited from craftsmanship to the development of education. Post-industrial society is characterised by the possession of knowledge as opposed to the possession of the private property. He maintains that post-industrial society is dominated by the expansion of the non-profit sector; especially education, health and research. The finding buttresses the view of Heisig (2017), who maintains that there are two opposite perspectives on the future of capitalist societies, which are the constructive one and the harmful in regards to skills.

An in-depth interview which was conducted with a Production Unit Head in Firm B reveals thus:

> As far as the Production Unit is concerned, the transition from washer, filler, capper, labeler, packer and Pasteuriser to mojonner, domino, Crown Cork Hopper, cobrix, reflex, uncaser, Krones and carbon cooler has drastically reformed the essential nature of the production process, such that the expertise which employees used to exert declines astronomically consequently upon the lack of skill usage. Employees find themselves doing less of what used to be the tasks they carried out. On the other hand, the migration from manual machines to automated equipment enormously reduces the production costs following that it produces in large quantity. Technology places firms on a comparative and competitive edge. (IDI/Firm2/PM/May 2019).

The finding conforms with the view of Pen (1991), who maintains that in the spring of computerisation in the 1980s, there was intensive apprehension among managers and employees that the emergence of digital machines would eliminate them from the labour market. However, it eventually turned out to favour them in that they were opportune to acquire new skills bordering on digital operations of the digital machines without necessarily losing

their manual skills. In a similar vein, it corroborates the perception of Amobi (2018), who avers that when 31% of the current jobs get automated, the only thing that will stand some workers out is the amount of skill they possess. Hence, concerted efforts should be made to hone one's skill in order not to be relegated to the digital era. In other words, concerted efforts should be made to hone one's skill in order not to be relegated in the fourth industrial revolution.

The finding substantiates the standpoints of Okafor, Imhonopi and Urim (2011) who gather that the utilisation of internet services aided about 54.3% lecturers in private universities in South-Western Nigeria to publish their works. They further revealed that a total of 61.6% of the lecturers were able to attend conferences and about 74.2% of the lecturers were able to teach effectively with the aid of internet services. According to Okafor et al (2011), the preponderance of the respondents who were about 77.5% were observed to have been improved by the utilisation of internet services in improving the quality of teaching. Internet services were found to boost the research outputs of 79.1% of private university lecturers in South-Western Nigeria. The finding lends credence to the perspective of Schneider (1983), who contends that the digital workforce is one of the most significant ways in which technology has tremendously shaped the work. According to him, a digital worker is construed as the technology which is artificial intelligence, intelligent process automation, robotics, augmented reality and virtual reality. All these perform tasks, jobs, and activities previously accomplished by a human worker. According to Schneider (1983), digital workers are already being deployed by some business owners.

The finding is equally consistent with the view of Adler (1992), who avers that the work of the future will require a high level of skill to man the technology. The point being made is that possessing the new skills to man technology prevents workers from being affected by technological advancement. The finding similarly corroborates the position of Amobi (2018), who submits that the work of the future and the future of work will be so sophisticated that only those who possess digital skills will be able to compete comparatively in the fourth industrial revolution. Deducing from this assertion, those who fail to develop themselves digitally will be eliminated from the scheme of work as far as the digital era is concerned.

The finding lends credence to the position of Lima (2019), who contests that robots are not meant to replace human fire fighters; rather, they are invented as equipment to enable efficient fire-fighting as well as salvaging lives and properties. Lima (2019) stresses that, in an event of conflagration, or any other type of emergency, robots are quite apt in rescuing situations. Lima (2019) submits that workers recruited in Fire Service will never get rid of disaster. Regardless, robots, as well as future robots, can save lives and deal with catastrophes that should be invested in and researched. This finding is inconsistent with the claim of the deskilling proponents who assert that technology results in expropriation of skill by breaking work into smaller and simpler forms.

The finding is consistent with the viewpoint of Agbata (2018), who states that Silicon Valley welcomes entrepreneurs from all over the globe including other parts of the United States. He avows that it is one place where entrepreneurs vehemently believe that they can leverage various types of resources in order to take their businesses to an entirely new level. He stresses that the Silicon Valley model can as well work for a country like Nigeria. There are quite a number of lessons that the people of Africa can learn from Silicon Valley (Agbata, 2018). He affirms that Silicon Valley is a place where a number of the top global technology brands have come out of, except new ones such as Microsoft and Amazon which started elsewhere. One reality that stares one in the face is the fact that Silicon Valley is such a huge and complex environment.

An IDI which was carried-out in the Accounts Unit reveals thus:

> The advent of software has revolutionised the mode of doing work in the Accounts Unit, such that with the application of software, work is done within a timeline. These innovations greatly ease the stress of doing work. It is crystal evident that the planning aspect of accounting can never be taken over by technology. The Account Unit has transited from Excel to System Application in data processing. Despite the fact that software facilitates accounting records, finance reports, data analysis and tax returns, the cognitive skills of humans remain central. The employees in the Accounts Unit are saddled with the responsibility of sending financial reports to numerous customers which include the future trends and current financial status of the firm. All these tasks require human interventions before they can be done **(IDI, Firm2/AccM/May, 2019).**

The foregoing revealed enskilling tendency owing to the spring of accounting software has changed the complexities and technicalities of corporate accounting. These technicalities are assets of guidelines and regulations which businesses should stick to when submitting information. Information and Communication Technology accelerates the dissemination of information to numerous customers. Insight and analysis on the accounting, audit and tax issues impacting have been improved by the advent of accounting software. Getting work done with the aid of software packages simplifies the constraints encountered in the course of task execution in Account Unit such that tasks are done swiftly without experiencing much stress. In order to reinforce this finding, Wright and Schultz (2018), contends that technology is a tool to achieve one's goals and objectives. Thus, it is high time techno-pessimists began to explore and maximise technological advances. Otherwise, those who are technologically savvy will advantage of technology.

The finding corroborates the view of Fayehun, Omigbodun, and Owoaje, (2020), who maintain that mobile technology tends to catalyse access to healthcare in Nigeria, if well-regulated. In their view, inadequate infrastructure is considered as posing a barrier to mobile healthcare in Nigeria. Stefan Heunits and AFP through Getty Images. They maintain that mobile technology is key to a medical emergency, particularly with regards to the potential of increasing access to healthcare where resources are limited and where systems are under stress. The finding lends credence to the study done by Omolawal (2018) and Wang *et al.*, (2020), who contend that utilisation of information communication technology enhanced the practices of human resource management practitioners in Nigeria in terms of selection, recruitments and placements of employees. Regardless, Omolawal (2018) posits that the utilisation of information communication technology is low in Nigeria.

Influence of technology on job skill was discovered to be statistically significant in Firm A, whereas it was statistically insignificant in Firm B. This indicates that technology deskilled Workers in Firm A, whereas it enskilled workers in Firm B. The variations in both firms are explained in the fact that in Firm A, medium technology level unit employees were more autonomous than their counterparts in both low and high technology level units while employees in high level technology units in Firm B were more autonomous that their counterparts in both low and medium technology level units. The modes of production of both firms varied considerably as Firm A manufactured consumables while Firm B manufactured alcoholic and non-alcoholic drinks. Asides this, they did not utilise the same equipment in carrying out their job functions. These accounted for the discrepancy in the findings. Technology varies considerably from industry to industry and influences job skill differently which aptly echoes Blauner's industrial categorisation of 1964 with the position that technology in printing industry varies significantly from that of the automotive industry while that of

assembly plant differs considerably from that of the oil refining industry. Resultantly, employees in Firm B were found to possess dexterity owing to the equipment they utilised. These results are expected because both firms are not homogenous in terms of the deployment of equipment required in the discharge of duties and the end-products.

Theoretical Discussion of Findings

Labour Process Theory is quite suitable in providing a theoretical explanation for the paper in focus given that its theoretical underpinnings suitably capture the findings of the study which was gathered from Firm A owing that the differences in the mean job skill (66.75, 67.81 and 60.30) across the three levels of technology in Firm A were found to be statistically significant at p=0.04. The corollary of this is that technology deskilled workers which reflect the underlying tenets of Labour Process Theory. Bearing in mind that the finding revealed that technology deskilled workers in Firm A, it can be validly deduced that technology objectified and materialised workers in used value. By inference, the employees of Firm A were reduced to the status of a mere object as a result of utilising technology in carrying-out job functions. In a similar vein, the employees of Firm A were seen as raw materials which must bring value to the firm.

The finding equally mirrors the fundamental claims of the Labour Process Theory which centre on the workers lacking autonomy in terms of the planning of their jobs, determination of skills which should be exerted in the execution of tasks, monitoring of tasks and wage determination for the tasks that are executed particularly whether their wages are commensurate with the skills exerted in carrying-out job functions. The point being established in this context is that the employees of Firm A lacked autonomy about the planning of their jobs; skill exertion in the tasks being executed; monitoring of their job; and wage determination for the skills they exerted in discharging their duties. It then logically follows that the fundamental claims of Labour Process Theory ultimately border on the motive of the capitalists to separate the work into the conception and the execution thereby the management is saddled with the planning of the work while the shop-floor workers are being saddled with the doing of the work. In the light of this, work processes and technology rendered employees deskilled following that capitalists aim at reducing the costs of production by adopting technology in order to optimise productivity.

In contrast to the suitability of Labour Process Theory to the findings that were gathered from Firm B, Labour Process Theory did not capture the findings that were discovered from Firm B taking into knowledge that the employees of Firm B enjoyed considerable autonomy in planning, monitoring and wage determination of their jobs more than their counterparts in Firm A given that technology was found not to degrade the employees in Firm B following that the differences in the mean job skill across the three technological levels were found to be statistically insignificant at p=0.2. What this signifies is that technology did not deskill employees in Firm B which contradicts the fundamental claims of Labour Process Theory. What can be concluded from this finding is that the employees of Firm B were not objectified nor materialised in used value which indicates that such employees were not perceived as individuals who were meant to bring value to the firm. Similarly, the employees of Nigeria Plc. were not reduced to the status of a mere object. What accounted for this trend is that the employees in high technological units were found to possess high skill levels which shielded them from being deskilled by technologies which they utilised in carrying-out job functions.

Another crucial point that is worthy of confirming is that judging by the result gathered from Firm B, the employees of the said firm were autonomous when it comes to the exertion of

expertise in task execution. This refutes the stance of Labour Process Theory. The mixed finding can be justified by the variations in the modes of production of the two firms in perspective. Technically, bearing in mind that the two firms differed considerably in the modes of their production, it follows that the technology they both adopted varied which required different skills to man them. This is one of the flaws of Labour Process Theory as it did not take into account the fact that firms vary considerably in their modus operandi which suggests that the technology varies significantly from one firm to another which has various implications on the skill requirements depending on the context of the firms. This justifies the inability of Labour Process Theory to suitably explain influence of technology on work in Firm B This shows that no theory is entirely immune from criticisms as flaws are inevitable.

It is pertinent to establish that the crop of workers which the study focused on were the permanent staff of the selected firms who underwent training upon their recruitments, selections, placement, and probations. Having undergone series of training upon their recruitments and having stayed long on their jobs, they became professionals, especially in Firm B In this wise, they became skilled. Workers who studied courses such as Mechatronics, Engineering and Automation, Artificial Intelligence and Robotics were mostly recruited into the selected firms to man automated equipment owing to their expertise so much so that they were autonomous in their jobs. Given this, they enjoyed diversity, value-adding, and per capita income of Culinary Unit, Production Units and others, following that the selected firms were manufacturing companies that utilised advanced technologies for the manufacturing of commodities. Given the biases for the aforementioned courses, exceptionally-skilled employees were recruited to man the sophisticated equipment which enabled them considerable leverage to call the shots in their jobs without necessarily being at the mercy of the management. In strict consonance with the International Standard Organisation's Law which states that the food and beverage industry should migrate from manual technology to semi-automated technology and to highly automated technology in order to get rid of the contaminations that usually accompany the end-products, the selected firms in the food and beverage industry adopted sophisticated technologies which required professionals to operate them.

Explanation for the Theoretical Model

The theoretical model was developed for the paper, which typically explains influence of technology on job skill. The theoretical model essentially portrays influence of independent variable (technology) on the dependent variable (job skill) used in the study. It was discovered that technology significantly affected job skill depending on the sophistication of the equipment utilised. It is crucial to establish that the skill level possessed by an employee considerably determined the levels of autonomy. It is noteworthy that the level of dexterity of an employee considerably determined the level of autonomy.

In other words, the theoretical model centres on influence of technology on job skills. The technology which a worker utilises in discharging his tasks has a way of enhancing or declining his or her skill. A worker who was previously using a manual tool to carry out tasks can learn about the digital machine which adds to his or her existing skill. In this wise, such a worker has added to his or her existing scope of epistemology without necessarily having to lose the manual skill. Conversely, a worker who was previously operating manual food analyser and manual beverage analyser who eventually operated semi-automated food analyser and semi-automated beverage analyser and in the long run migrated to full automated food analyser and full automated beverage analyser would have lost the manual skills of operating this equipment, considering that he or she would have been subjected to routinely pressing buttons as opposed to using his or her manual knowledge and intelligence. This would considerably

limit his or her dexterity and expertise in imaginatively fabricating the products with his or her hands.

When a tool dictates the rhythms and pace of work, the person using it will be rendered deskilled given that he or she cannot utilise his or her expertise. To become an object rather than a subject in the workplace does not allow autonomy of a worker. Nonetheless, the utilisation of equipment greatly facilitates a collegial tie between a manager and a shop floor worker by conveying pieces of information to each other with the aid of information and communication technology. In this respect, the notion of alienation becomes illusory. In a scenario where a worker is apprehensive about the possibility of an employer bringing on board a technology that tends to take over his job or skill, he or she will not wholeheartedly discharge his or her duty. In other words, the thought of being replaced by a robot dampens the morale of a worker. Consequently, he or she will resort to labour turn-over which indicates the migration of an employee from one organisation to another due to numerous reasons which range from fringe benefits, lack of allowances, supervision, promotion, self-esteem, poor work conditions, poor salary packages and obsolete equipment. If a worker is not autonomous in the equipment he or she uses to carry-out tasks, there is a huge likelihood that he or she will not be loyal to the goals, objectives, mission and vision of the firm where he or she works. To this end, the equipment which a worker utilises in discharging his or her duty is germane to his or her level of autonomy.

Conclusion

With the advent of modern technology, there has been a significant transformation from low technology to medium and high technology. This advancement has influenced job skill as demonstrated by the different effects of Firm A and Firm B. There are two perspectives when it comes to the influence of technology on work. Technology is bi-directional in nature, meaning that it can lead to either deskilling or enskilling. In Firm A, deskilling trend was found to be dominant, while in Firm B, enskilling trend was dominant. This finding agrees with the standpoint of neo-Marxist scholars who argue that the influence of technology on work is bi-directional.

It is important to note that technology is a double-edged sword. While it has the potential to enskill employees, it also has the potential to deskill them. Skill polarisation should be given emphasis, rather than the contention of rival groups on whether technological advances deskill or enskill employees. It is, therefore, recommended that enterprise owners should invest in grooming their employees to combat the challenges occasioned by technological advances that shape the activities of firms. Organisations' management should ensure adequate capacity building for employees to adapt to the emerging technological trend and make proper use of the equipment adopted by organizations. In general, developing one's skills is a solution to prevent technology from causing a decline in skills. This is because people who possess creativity, inventiveness, imagination, innovation, and ambidexterity are not affected by technological advancements in the post-Fordist era. Therefore, organizations can conduct further research to identify other organizational factors that contribute to the loss, gain, or polarization of skills in modern industrial settings.

References

Adepatan, A. 2020. Computer Professionals Task Government on Fourth Industrial Revolution.*The Guardian*. Retrieved Aug. 5, 2020, from https://guardian.ng.

Adepatan, A. 2020. Nigerians Pay #2tr for Calls, Data in Six Months. *The Guardian.* Retrieved Aug. 20, 2020, from https://guardian.ng.

Adepatan, A. 2020. Government Demands NIN for Sim Registration Update. *The Guardian*. Retrieved Jan. 11, 2020, from https://guardian.ng.

Adepatan, A.2020. Subscribers Consume 125,149. 86TB of Data as 4G Coverage Hits 37%. *The Guardian*. Retrieved Jan. 4, 2021, from https://guardian.ng.

Adepatan, A.2020. Household Internet Access in Urban Area Twice as High as in Rural Areas. *The Guardian*. Retrieved Jan. 8, 2021, from https://guardian.ng.

Adepatan, AandOnyedika-Ugoeze, N.May 1[illegible] 2020. How Virtual Meetings Expose Governments, Business Organisations, Churches and Schools and others to Attacks and Fraud. *The Guardian*. Retrieved May [illegible]20, from https://guardian.ng.

Adler, P. S. 1988. Automation, Skill and the Future of Capitalism. *Berkeley Journal of Sociology*, *33*, 1-36.Adler, P. S. 1988, *Berkeley Journal of Sociology*

Baran, P. A., Bellamy, and Sweezy, P. M. 2017. *The Age of Monopoly Capital: Selected Correspondence of Paul M. Sweezy and Paul A. Baran, 1949-1964*. NYU Press.

Bawalla, O. G. and Daniel, D. O. 2021. Technological Advancement, Issues, Challenges and Perspectives for Human Resource Practice in Nigeria. *Journal of Social Sciences* 7(3), 47-55.

Blauner, R. 1964. *Alienation and Freedom: The Factory Worker and his Industry*, Chicago and London: University of Chicago Press

Burawoy, M. 1985. Politics of Production: Factory Regimes under Capitalism and State Socialism. . *American Journal of Sociology*, *106*, 1099-120.

Eden, C. A., Chisom, O. N., and Adeniyi, I. S., (2024). Promoting Digital Literacy and Social Equity in Education: Lessons from Successful Initiatives, International Journal of Management & Entrepreneurship Research, P-ISSN: 2664-3588, E-ISSN:2664-3596, Volume 6, Issue 3, P.No.687-696, March, 2024, DOI: 10.51594/ijmer.v6i3.880, Fair East Publishers, Journal Homepage: www.fepbl.com/index.php/ijmer/

Edwards, R.C. 1979.*Contested Terrain: The Transformation of Work in the Twentieth Century.* New York: Basic Books.

Fayehun, F., Omigbodun, A., and Owoaje, E.T. 2020. Mobile technology can improve access to healthcare in Nigeria if its regulated. The conversation.com, Lack technology infrastructure is a barrier to mobile healthcare in Nigeria Stefan Heunis/AFP via Getty images. May 6 2020 5:01pm SAST.

Forster, Y., Hergeth, S., Naujoks, F., Krems, J. F., and Keinath, A. 2020. Self-report measures for the assessment of human–machine interfaces in automated driving. *Cognition, Technology & Work*, *22*, 703-720.

Frank Vanclay, James T. Baines & Nicholas C. Tailor, 2013, Principles for Ethical Research Involving Humans: Ethical Professional Practice in Impact Assessment Part I, Impact Assessment and Project Appraisal, Volume 31, 2013-Issue 4, https://doi.org/10.1080/14615517.2013.850807.

Granter, E., and Edgell, S. 2019. The sociology of work: Continuity and change in paid and unpaid work. *The Sociology of Work*, 1-400.

Heisig, U. 2009. The deskilling and upskilling debate. *International handbook of education for the changing world of work: Bridging academic and vocational learning*, 1639-

International Standard Organisation ISO 2000: 2005, *Food Safety and Management System (FSMS)*, Universal System, USA.

Marx, K.,1844. Capital: A Critique of Political Economy. Vol 1. London Press

Meyers, P. W., Sivakumar, K., & Nakata, C. 1999. Implementation of industrial process innovations: factors, effects, and marketing implications. *Journal of Product Innovation Management: An International Publication of the Product Development & Management Association*, 16(3), 295-311.

Omolawal, S.A. 2018. Influence of Utilisation of Information Technology for Staff Recruitment on the Quality of Staff Recruited in South-West Nigeria. *International Journal of Economic and Business Management*. 6(2). 14-23.

Onyeonoru, I.P., 2005. *Industrial Sociology: An African Perspective.* Samilad Press, Ibadan, Nigeria.

Smith, A. 1776. *An inquiry into the nature and causes of the wealth of nations*: Volume One. London: printed for W. Strahan; and T. Cadell, 1776.

Thompson, P., and Smith, C. 2009. Labour power and labour process: contesting the marginality of the sociology of work. *Sociology*, 43(5), 913-930.

Vallas, S. P. 1988. New Technology, Job Content, and Worker Alienation: A Test of Two Rival Perspectives. *Work and Occupations*, 15(2), 148-178.

Vyshnavi, A., Manasa, A., Hamsika, C. and Shalini, P. 2020. UV disinfection robot with automatic switching on human detection. *Eai endorsed transactions on internet of things*, *6*(23).

Appendix

Appendix 1: Academic questionnaire

Department of Sociology

Faculty of the Social Sciences

University of Ibadan

Dear Respondent,

I am a postgraduate student of the Department of Sociology, Faculty of the Social Sciences, University of Ibadan. This questionnaire is designed to obtain information on **Influence of Workplace Technology on Job Skill in Firm A and Firm B, Lagos, Nigeria.** Your open and sincere responses will be treated with utmost respect and confidentiality. The information is required solely for research purposes. Kindly indicate your consent by ticking the appropriate box below before proceeding to supply the needed pieces of information in the questionnaire. Please, tick or answer under the response column as appropriate.

Thank you.

Idowu Sulaimom **ADENIYI**

I Consent I Decline

The Profile of the Organization

Name of the organisation:

Department:

Year of employment:

Section 1: To What Extent do you Agree or Disagree with the Truth in the Following statements?

SN	ITEMS	Strongly Agree	Agree	Not Sure	Strongly Disagree	Disagree
A	I have knowledge to do my work well.					
B	I have the knowledge to get my work done					
C	I have the ability to get my work done unsupervised.					
D	It takes me much time to finish a particular task.					
E	I am quite confident in doing my work.					

F	I have creativity to get problems in my job solved					
G	I always find my work very easy.					
H	I have deep understanding of my job.					
I	I have a clear idea of what I am supposed to do in my job.					
J	My job requires that I do things just the way I am told.					
K	My task is always assessed by those who are above me in my unit.					
L	I always come up with something new in my job.					
M	I have the ability to carry out complex tasks in my job.					
N	I am prepared to face difficult tasks in my job.					
O	I have coordinating capacity in doing my job in my unit.					
P	I have the capacity to do multiple tasks in my job in my unit.					
Q	I can do my work from the beginning to the end.					
R	I have the competence to do my job well.					

Reliability Measures of Average Job Skill

Items	**Firms' Cronbach's Alpha coefficient**	
	Firm A	**Firm B**
I have the knowledge to get my work done	.931	.837
I can get my tasks accomplished independently	.927	.830
I have the ability to get my job done unsupervised	**.**927	.834

It takes me much time to get a particular task finished	.926	.835
I am confident in my work	.929	.829
I have creativity to get problems in my job solved	.927	.829
I always find my work very easy	.927	.841
I have deep understanding of my work	.929	.834
I have a clear idea of what I am supposed to do in my job	.93	.836
I always come up with something new in my job	.9	.833
I have the ability to carry-out complex tasks	.927	.829
I am prepared to face difficult tasks in my job	.928	.831
I have coordinating capacity in my job	.927	.831
I have the capacity to do multiple tasks in my job	.929	.829
I can do my work from the beginning to the end	.930	.833
I have the competence to do my job	.932	.835

Information About the Article/Makale Hakkında Bilgiler

The Ethical Rules for Research and Publication / Araştırma ve Yayın Etiği

The authors declared that the ethical rules for research and publication followed while preparing the article.

Yazarlar makale hazırlanırken araştırma ve yayın etiğine uyulduğunu beyan etmiştir.

Conflict of Interests/ Çıkar Çatışması

The authors have no conflict of interest to declare.

Yazarlar çıkar çatışması bildirmemiştir.

Grant Support/ Finansal Destek

The authors declared that this study has received no financial support.

Yazarlar bu çalışma için finansal destek almadığını beyan etmiştir.

Author Contributions/ Yazar Katkıları

The draft process of the manuscript/ Makalenin Hazırlanma Süreci I.S.A./S.A.O., Writing The Manuscript/ Makalenin Yazılması I.S.A./S.A.O., Submit, Revision and Resubmit Process/ Başvuru, Düzeltme ve Yeniden Başvuru Süreci I.S.A./S.A.O.

.

Journal of Applied and Theoretical Social Sciences

JATSS, 2024; 6(1), 27-49

First Submission: 02.02.2024
Revised Submission After Review: 06.03.2024
Accepted For Publication: 30.03.2024
Available Online Since:31.03.2024

Research Article

The Effect of Non-Performing Loans on Sector Profitability in the Turkish Banking Sector

Yasin KÜTÜK [a] & Ayşe ÇETİN YILMAZ [b]

Abstract

The main purpose of this study is to determine the impact of non-performing loans (NPLs) on profitability of banking industry in Turkiye. In this study, in order to examine the basic indicators of profitability, non-performing receivables and consumer credit cards, non-performing housing and vehicle loans, non-performing consumer loans, consumer loans, loans and credit cards, net profit-loss and non-performing loans were compiled to generate a data set for the period between 2004 and 2018. Due to the different integration levels of the series obtained, models based on the autoregressive distributed lag (ARDL) approach, which is one of the time series regression methods, were established to analyze. Then, the effect of non-performing receivables on the banking sector profitability was examined. The initial findings reveal that the increase in non-performing receivables significantly reduced the profit of the banking sector.

Keywords: non-performing receivables, bank's profitability, ARDL bounds testing

JEL Codes: G21, L21, C32

[a] Asst. Prof. Dr., Altınbaş University, School of Economics, Administrative and Social Sciences, Department of Economics, Istanbul/ Turkey, yasinkutuk@itu.edu.tr, ORCID ID: https://orcid.org/0000-0003-2304-8309(Corresponding Author)

[b] Master's Degree Student, Social Sciences Institute, Dept. of Financial Economics, İzmir/Turkey, cetinnaysee@gmail.com, ORCID ID: https://orcid.org/0000-0001-7889-7207

Journal of Applied and Theoretical Social Sciences

JATSS
e-ISSN:2687-5861

JATSS, 2024; 6(1), 27-49

İlk Başvuru:02.02.2024
Düzeltilmiş Makalenin Alınışı:06.03.2024
Yayın İçin Kabul Tarihi:30.03.2024
Online Yayın Tarihi:31.03.2024

Araştırma Makalesi

Türk Bankacılık Sektöründe Takipteki Alacakların Sektör Karlılığına Etkisi

Yasin KÜTÜK [a] & Ayşe ÇETİN YILMAZ [b]

Öz

Bu çalışmanın amacı Türkiye'de bankaların takipteki alacaklarının sektör karlılığına etkisini belirlemektir. Bu çalışmada karlılığın temel göstergelerini incelemek amacıyla, takipteki ihtiyaç kredileri ve bireysel kredi kartları, takipteki konut ve taşıt kredileri, takipteki tüketici kredileri, tüketici kredileri, krediler ve kredi kartları, dönem net kar-zararı ve takipteki alacakların 2004 - 2018 tarihleri arasındaki aylık bilançoları Bankacılık Düzenleme ve Denetleme Kurulu (BDDK) verileri ile derlenmiştir. Elde edilen serilerin farklı bütünleşme seviyeleri nedenle zaman serileri regresyonu yöntemlerinden ARDL yaklaşımı temel alınarak modeller kurulmuş ve banka karlılığı analiz edilmiş, takipteki alacakların bankacılık sektörü karlılığına etkisi incelenmiştir. Elde edilen ilk bulgulara göre, takipteki alacakların artışının, bankacılık sektörünün karını önemli ölçüde düşürdüğü ortaya çıkmaktadır.

Anahtar Kelimeler: takipteki alacaklar, banka karlılığı, ARDL yaklaşımı

JEL Kodlar: G21, L21, C32

[a] Dr.. Öğr. Üyesi, Altınbaş Universitesi, İktisadi,İdari ve Sosyal Bilimler Fakültesi, Ekonomi Bölümü, İstanbul/ Türkiye, yasinkutuk@itu.edu.tr, ORCID ID: https://orcid.org/0000-0003-2304-8309 (Corresponding Author)

[b] Mastır Öğrencisi, Sosyal Bilimler Enstitüsü, Finansal Ekonomi Bölümü, İzmir/Türkiye, cetinnaysee@gmail.com, ORCID ID: https://orcid.org/0000-0001-7889-7207

Introduction

Banks are economic institutions that serve the needs of private and legal persons, as well as states. Their main task is to bring together those who supply money and those who demand money. Banks are of great importance in financing economic activities. They are profit-oriented organizations, and they need to make a profit to ensure the continuity of their activities and meet their costs. Profitability is one of the most important elements of a business, and non-performing loans are one of the factors that affect it.

Non-performing loans can be defined as the result of a significant deterioration in the repayment agreement between the bank and the loan debtor, leading to the possibility of loss and delay in collection (Aktaş, 2000). Non-performing loans, non-performing receivables, and non-performing assets are used interchangeably in the banking literature. There may be many reasons for non-performing loans, originating from the bank, the environment, the company, or the individual.

The delay in the collection of loans and the fact that they become problematic affect the bank negatively. Increases in the NPL ratio indirectly affect the banking sector and the entire country's economy negatively (Yuca, 2012). From the bank's point of view, income loss is experienced as the funds allocated for non-performing loans cannot be transferred to areas with higher returns.

This study aims to investigate the relationship between net profit/loss and non-performing receivables in the Turkish banking sector. To achieve this, literature review will examine previous studies on this topic in the second. The data set will be introduced the purpose-built one in the third section. The econometric methodology will analyze in the fourth section. In the fifth, conclusion will finalize this paper by sharing the initial findings and their discussions.

Literature Review

The profitability of banks is a critical issue in the financial industry, and numerous studies have been conducted to identify the determinants of bank profitability. One factor that has been widely studied is the relationship between non-performing loans and bank profitability. Non-performing loans (NPLs) refer to loans that are in default or are close to being in default, and they are considered a major issue for banks worldwide. The following is a collection of studies that examine the relationship between non-performing loans and bank profitability.

The relationship between non-performing loans (NPLs) and bank profitability is a critical area of study in Iqbal and Nosheen (2023). NPLs represent loans that are in default or close to default, posing risks to financial institutions. Understanding how NPLs affect profitability is essential for policymakers, regulators, and practitioners.

The literature on determinants of fon-performing loans identifies two main streams when examining the determinants of bad loans:

Macroeconomic Determinants

These factors consider the broader economic environment (Syed, 2021; Manz, 2019). For instance, GDP growth, unemployment rates, and real interest rates influence credit risk. A downturn in the economy often leads to higher NPL ratios.

Bank-specific Determinants

These factors focus on internal bank characteristics (Kjosevski & Petkovski, 2021; Vogiazas & Nikolaidou, 2011). Enhanced competition due to deregulation can lead to increased credit risk. Banks may relax lending standards to gain market share, resulting in higher NPLs.

The most common indicator of credit risk on the literature looking the relation of NPLs and profitability is the ratio of NPLs to total bank loans. A high level of NPLs negatively impacts bank profitability.

Messai and Jouini (2004–2008) examined 85 banks in Italy, Greece, and Spain. They found that bank profitability decreases as NPLs rise. Additionally, unemployment rates, real interest rates, and weak credit quality positively affect the level of NPLs. Nikolopoulos and Tsalas (2017) provide a comprehensive review of NPL determinants. They emphasize the importance of both macroeconomic and bank-specific factors in explaining credit risk evolution. Their study highlights the broader legal and regulatory environment's influence on NPLs. Other studies have documented that elevated NPLs contribute to bank collapses and increased vulnerability in the banking system. The outbreak of the global financial crisis further exacerbated NPL levels, affecting liquidity and profitability.

Akhtar et al. (2011) examined the profitability of Islamic banks in Pakistan and created two models based on their study. They used return on assets (ROA) and return on equity (ROE) as dependent variables in their models. According to the results of the study, they concluded that there is a statistically significant and inverse relationship between non-performing loans and return on assets. Osuagwu (2014), on the other hand, investigated the factors affecting bank profitability using data from selected banks in Nigeria. The study concluded that there is a significant and negative relationship between non-performing loans and bank profitability. Majumder and Uddin (2017) investigated the factors affecting the profitability of four national banks in Bangladesh between 2010 and 2014. They used return on assets, capital adequacy ratio, non-performing loans ratio, total assets, liquidity ratio, non-interest income ratio, and ratio of off-balance sheet activities to total assets as independent variables. As a result of their study, they concluded that there is a statistically significant and negative relationship between non-performing loans and return on assets.

The factors affecting the profitability of Islamic banks is investigated by Bashir (2003) in the Middle East during the period of 1993-1998 and concluded that the non-performing loan ratio causes high profitability. Bodla and Verma (2006) investigated the determinants of the profitability of public banks in India between 1991 and 2004. They determined the net profit of the bank as the dependent variable and found that fixed costs and non-performing loans/total loans ratio have a negative relationship with profitability. Sufian and Chong (2008) examined the determinants of the profitability of banks in the Philippines between 1990 and 2005. As a result of the research, it was concluded that non-performing loans, general administrative expenses and inflation were negatively correlated with profitability.

For Turkish literature, Aka (2019) conducted research on the determinants of bank profitability using data from Kuveyt Türk, Türkiye Finans and Albaraka participation banks between the years 2010-2018. They examined the effect of non-performing loan rates on return on assets and return on equity capital and found a significant relationship between non-performing loans and profitability. Aydın (2019) empirically analyzed the determinants of the profitability of Turkish banks, as well as bank- and sector-specific variables and macroeconomic factors. As a result of the study, it was concluded that there is a statistically significant and negative relationship between the NPL ratio and the return on assets (Aydın, 2019: 186-187). Kaya (2002), who analyzed the determinants of net interest margin, return on assets and return on equity in the Turkish banking system during the period 1997-2000, determined that there is a negative relationship between the ratio of net non-performing loans to total assets (Kaya, 2002). Gülhan and Uzunlar (2011) analyzed the profitability of local and foreign banks operating in Turkey between 1990 and 2008, and they concluded that there is a statistically significant and negative relationship between the non-performing loans/total loans ratio of banks and their profitability. Güneş (2015) investigated the factors affecting the profitability of the Turkish banking sector between 2002 and 2012. They used ROA and ROE as dependent variables and concluded that there is a negative and significant relationship between return on assets and non-performing loans. Alper and Anbar (2011) aimed to determine the variables that have an impact on the profitability of banks in Turkey between 2002 and 2010. In the study, in which ROA and ROE were used as dependent variables, it was revealed that there is a negative relationship between non-performing loans and profitability. Karamustafa (2013) conducted a study on the importance of NPL ratios in terms of the banking sector and the financial system. The study found that the NPL ratio is an essential indicator of the financial health of banks and the overall economy. Şahbaz (2010) studied the macroeconomic effects of problem loans in the Turkish Banking Sector and investigated the causes and effects of non-performing loans in their work. The study found that non-performing loans have a significant impact on the stability of the banking sector and the overall economy.

In conclusion, the studies above suggest that non-performing loans have a negative impact on bank profitability. Therefore, banks should strive to reduce their non-performing loans ratio to maintain their profitability.

Data Set

This study aims to explore the relationship between net profit/loss and non-performing receivables in the Turkish banking sector. The data used in the study were obtained from the monthly balance sheets of the Central Bank of the Republic of Turkey, EDDS[1], and BRSA[2], covering the years 2004-2018 for banks operating in Turkey. The analysis was based on 180 months of data. The dependent variable for the study is Net Profit-Loss, while the independent variables include Loans, NPL, Consumer Loans (Short Term, Medium-Long Term, Total), Credit Cards (Short Term, Medium-Long Term, Total), NPL Consumer Loans, NPL Housing Loans, NPL Vehicle Loans, and Non-Performing Consumer Loans, as well as Non-Performing Personal Credit Cards.[3]

[1] the Electronic Data Delivery System (provided by the CBRT).

[2] Banking Regulation and Supervision Agency (aka BDDK in Turkish).

[3] The abbreviations to be used later are as follows: ROA: Return on Assets Ratio, ROE: Return on Equity, NIM: Net Interest Margin, DNKZTP: Total Net Profit and Loss for the Period, KKTP: Credit Cards Short Term Total, KKOUTP: Credit Cards Medium-Long Term Total , KKTP: Total Credit Cards, CRTP: Total Loans, TATP: Total NPLs, TBKKTP: Total Non-Performing Personal Credit Cards, TIKTP: Total Non-

The Consumer Price Index (CPI) was used as a macroeconomic indicator for inflation, while the Consumer Confidence Index was used as a measure of consumer sentiment. This study is aligned with previous research in the literature, which mostly includes three variables: return on assets (ROA), return on equity (ROE), and net interest margin. For this study, the period's net profit-loss was used as the dependent variable.

The profitability ratios of the banking sector and the non-performing loan ratios are two important metrics that are commonly used to measure the financial health of banks. The profitability ratios, which include return on assets (ROA) and return on equity (ROE), provide insight into how well a bank is able to generate profits from its assets and equity. On the other hand, the non-performing loan ratios show the percentage of loans that are in default or are not being paid back on time. By analyzing these ratios, investors and stakeholders can assess the overall risk profile of a bank and make informed decisions about their investments or partnerships with the institution. The table below presents the latest figures for these ratios in the banking sector.

Table 1

The Profitability Ratios of the Banking Sector (%)

Year	Return on Equity (%) Net Profit (Loss) for the Period / Average Equity	Return on Assets (%) Net Profit (Loss) for the Period / Average Total Assets	Profit (Loss) Before Taxes / Average Total Assets (%)
2018	14.83	1.45	1.77
2017	15.88	1.62	2.02
2016	14.28	1.50	1.89
2015	11.28	1.16	1.48
2014	12.25	1.33	1.69
2013	14.19	1.60	2.02
2012	15.68	1.83	2.35
2011	15.48	1.74	2.22
2010	20.12	2.46	3.03
2009	22.92	2.63	3.27
2008	18.74	2.05	2.54
2007	24.77	2.78	3.41
2006	21.01	2.60	3.31
2005	12.14	1.72	2.68
2004	15.76	2.36	3.32

Note. BDDK (2020).

Performing Consumer Loans, TKKTP: Total Non-Performing Housing Loans, TKRKTP: Consumer Loans Short Term Total, TKROUTP: Medium-Long Term Total of Consumer Loans, TKRTP: Total of Consumer Loans, TTAKTP: Total of Non-Performing Vehicle Loans, TTKTP: Total of Non-Performing Consumer Loans.

Table 1 clearly shows that the banking sector had the highest return on equity in 2009 and the lowest in 2015. The highest return on assets ratio, at 2.78, was in 2007, while the lowest, at 1.16, was in 2015.

Table 2

Non-Performing Receivables in the Banking Sector for the Years 2004-2018

Year	NPLs (Total, million TL.)
2018	96655.90
2017	63989.96
2016	58163.50
2015	47540.86
2014	36425.71
2013	29621.55
2012	23407.92
2011	18972.69
2010	19993.03
2009	21852.87
2008	14052.83
2007	10345.33
2006	8550.09
2005	7807.77
2004	6355.70

Note. BDDK (2020).

In the Turkish banking sector, the rate of loans extended by banks has increased in recent years, along with a parallel increase in non-performing loans. To better analyze non-performing loans, data for five years has been arranged in a table. According to the table, receivables increased from 6,355 million TL in December 2004 to 96,655 million TL in December 2018 (Table 2).

Econometric Methodology

Since it is primarily studied with time series econometrics, the integration levels of the series were determined using unit root tests, such as the extended Dickey-Fuller test (Hamilton, 1994), the Phillips-Perron test, which includes non-parametric corrections of error terms (Greene, 2003), and the Kwiatowski et al. (1992) test, which involves performing the unit root test with LM statistics using the reverse hypothesis (Enders, 2008).

After performing unit root tests, the series to be used will be visualized. If variables with seasonality problems are found in these series, they will be adjusted for seasonal effects. This will enable the examination of the cointegration relationship between the series, taking into account the integration levels. If there is differentiation in integration levels, an ARDL model will be used for cointegration regression.

For the cointegration model, the following regression model (Equation 1) will be created after determining the lag lengths (parameter k). However, since the other variables except for inflation and confidence index are nominal and monetary amounts, logarithms of all variables will be taken to calculate elasticity coefficients simultaneously. In addition, the trend coefficient can be added to the model.

$$DNKZTSA = \beta_0+\beta_1 Enf_{t-k1}+\beta_2 Guven_{t-k2}+\beta_3 KKKTP_{t-k3}+ \beta_4 KKOUTP_{t-k4}+\beta_5 KKTP_{t-k5}+\beta_6 KRTP_{t-k6}+ \beta_7 TATP_{t-k7}+\beta_8 TBKKTP_{t-k8}+\beta_9 TIKTP_{t-k9}+\beta_{10} TKKTP_{t-k10}+\beta_{11} TKRKTP_{t-k11}+\beta_{12} TKROUTP_{t-k12}+\beta_{13} TKRTP_{t-k13}+\beta_{14} TTAKTP_{t-k14}+\beta_{15} TTKTP_{t-k15}+\varepsilon_t \quad \textbf{(1)}$$

Equation 1 includes the index "t" to show the month in which the time series is located. The indices between k1 and k15 represent the lag lengths. However, since the lag length of each series will be determined differently in ARDL, they are numbered separately between 1-15.

Furthermore, Equation 2 shows the Error Correction Model (ECM) required to obtain the short-run model.

$$\Delta DNKZTSA = \beta_0+\beta_1 \Delta Enf_{t-k1}+\beta_2 \Delta Guven_{t-k2}+\beta_3 \Delta KKKTP_{t-k3}+ \beta_4 \Delta KKOUTP_{t-k4}+\beta_5 \Delta KKTP_{t-k5}+\beta_6 \Delta KRTP_{t-k6}+ \beta_7 \Delta TATP_{t-k7}+\beta_8 \Delta TBKKTP_{t-k8}+\beta_9 \Delta TIKTP_{t-k9}+\beta_{10} \Delta TKKTP_{t-k10}+ \beta_{11} \Delta TKRKTP_{t-k11}+\beta_{12} \Delta TKROUTP_{t-k12}+\beta_{13} \Delta TKRTP_{t-k13}+\beta_{14} \Delta TTAKTP_{t-k14}+\beta_{15} \Delta TTKTP_{t-k15}+\beta_{16} Enf_{t-1}+\beta_{17} Guven_{t-1}+\beta_{18} KKKTP_{t-1}+ \beta_{19} KKOUTP_{t-1}+\beta_{20} KKTP_{t-1}+\beta_{21} KRTP_{t-1}+ \beta_{22} TATP_{t-1}+\beta_{23} TBKKTP_{t-1}+\beta_{24} TIKTP_{t-1}+\beta_{25} TKKTP_{t-1}+ \beta_{26} TKRKTP_{t-1}+\beta_{27} TKROUTP_{t-1}+\beta_{28} TKRTP_{t-1}+\beta_{29} TTAKTP_{t-1}+\beta_{30} TTKTP_{t-1}+\varepsilon_t \quad \textbf{(2)}$$

The ARDL cointegration test, which is run based on performing the integrated coefficient test (also known as the F-test) between β16- β30 in Equation 2, was performed by Pesaran et al. (2001) with the special F-table value presented in the article (Kütük, 2011).

Results

To prevent the time series from trending and causing spurious regression, stationarity was tested using the Dickey-Fuller Unit Root Test (Table 3), Phillips-Perron Test (Table 4), and KPSS (Kwiatkowski-Phillips-Schmidt-Shin) Unit Root Test (Table 5). Unit root tests are crucial in time series analysis to determine whether a variable exhibits a stochastic trend or is stationary in its levels. Stationarity is essential for reliable modeling and forecasting. If the variables are found to be stationary in their levels, it implies that they do not have a unit root and can be considered as stable over time.

Stationarity is a fundamental property that ensures the statistical properties of a variable remain constant over time. When variables are deemed stationary in their levels, it signifies that they do not exhibit systematic trends, and their statistical characteristics such as mean and variance remain constant across different time periods. The stationarity test results are provided in the below tables, which indicate all variables are found to be statiotionary in their levels.

Table 3

ADF Unit Root Test Results

Variable	I(0) Constant	I(0) Constant and Linear Trend	I(1) Constant	I(1)Constant and Linear Trend
DNKZTP	0.1342	-1.7057	-2.7562	-2.9116
LN(DNKZTP)	-0.8266	-2.3347	-4.2582	-4.1526
ENF	3.4332	4.0261	0.9255	-4.1634
LN(ENF)	1.6384	0.5012	-2.3355	-2.67
GUVEN	-2.0218	-2.5771	-4.2423	-4.1866
LN(GUVEN)	-1.9543	-2.5853	-4.1052	-4.045
KKKTP	0.8462	-2.7292	-2.835	-3.1538
LN(KKKTP)	-1.281	-1.479	-3.0167	-3.3741
KKOUTP	-1.8785	-3.0215	-3.6377	-3.6284
LN(KKOUTP)	-6.9839	-8.2405	-2.8606	-3.4888
KKTP	0.6111	-2.8595	-3.0009	-3.221
LN(KKTP)	-1.2877	-1.524	-2.8739	-3.2304
KRTP	4.5286	2.5522	-1.6482	-3.9732
LN(KRTP)	-2.9192	-2.5535	-5.5689	-6.2315
TATP	2.6526	1.4415	-1.0459	-2.0496
LN(TATP)	0.6296	-2.1496	-4.8866	-5.0353
TBKKTP	-1.512	-3.4365	-2.2882	-2.4029
LN(TBKKTP)	-2.7904	-3.5258	-3.8517	-3.9486
TIKTP	0.0624	-1.6955	-4.5579	-4.6534
LN(TIKTP)	-2.9474	-2.1011	-3.9384	-4.6288
TKKTP	-1.2202	-2.2805	-2.9889	-2.9474
LN(TKKTP)	-2.7152	-2.4917	-2.7826	-5.016
TKRKTP	2.2611	0.5053	-0.3711	-1.5831
LN(TKRKTP)	0.8229	-2.903	-2.8849	-3.1727
TKROUTP	0.784	-2.1499	-3.4192	-3.4043
LN(TKROUTP)	-3.2368	-6.4249	-1.0233	-2.7068
TKRTP	1.0357	-2.0804	-3.4848	-3.5954
LN(TKRTP)	-4.9408	-4.0416	-3.2022	-6.9093
TTAKTP	-2.1893	-1.9586	-4.0758	-4.2805
LN(TTAKTP)	-5.0046	-2.3623	-2.9243	-5.0539
TTKTP	-0.4002	-2.6537	-2.833	-2.8831
LN(TTKTP)	-2.9123	-1.6985	-3.5298	-4.4927

Note. Researcher's Computation

Table 4

PP (Phillips–Perron) Unit Root Test Results

Variable	I(0) Constant	I(0) Constant and Linear Trend	I(1) Constant	I(1)Constant and Linear Trend
DNKZTP	-3.4366	-5.4812	-17.1713	-17.4198
LN(DNKZTP)	-5.6446	-6.8379	-39.9992	-40.2212
ENF	5.1137	4.7297	-8.7512	-8.9279
LN(ENF)	1.7819	-0.0781	-9.6116	-9.6851
GUVEN	2.4051	-2.9573	-11.7054	-11.723
LN(GUVEN)	-2.2681	-2.9217	-11.5441	-11.522
KKKTP	1.9294	-0.9936	-11.5681	-11.8296
LN(KKKTP)	-4.1263	-3.6972	-7.779	-8.8087
KKOUTP	-1.3435	-1.8441	-5.1092	-5.1011
LN(KKOUTP)	-4.2721	-3.1639	-11.4575	-11.6777
KKTP	1.5619	-1.2922	-11.1061	-11.3516
LN(KKTP)	-4.2715	-3.572	-7.3072	-8.6154
KRTP	4.2836	-0.2523	-11.2873	-12.2314
LN(KRTP)	-4.2711	-3.4767	-10.1481	-10.8844
TATP	5.0244	2.3123	-6.2249	-8.0023
LN(TATP)	1.0761	-3.226	-10.798	-11.0701
TBKKTP	-46.0948	-175.5601	-1797.073	-1812.346
LN(TBKKTP)	-7.9289	-15.6512	-93.6089	-120.0489
TIKTP	0.4203	-1.5521	-12.7497	-12.8252
LN(TIKTP)	-2.7146	-1.2009	-11.8172	-12.0256
TKKTP	-1.0939	-1.4768	-7.7002	-7.6812
LN(TKKTP)	-2.4727	-1.0146	-16.2294	-16.3657
TKRKTP	4.9174	2.4758	-11.7071	-12.3311
LN(TKRKTP)	0.4914	-1.3865	-12.0298	-12.0262
TKROUTP	1.0239	-2.287	-3.9242	-3.8253
LN(TKROUTP)	-8.8681	-6.5138	-5.2961	-6.3507
TKRTP	1.3323	-2.1744	-3.9846	-3.9426
LN(TKRTP)	-8.0193	-4.9249	-4.9516	-6.0731
TTAKTP	-1.8697	-1.4329	-8.0272	-8.3584
LN(TTAKTP)	-3.8159	-2.3917	-12.6507	-13.3252
TTKTP	0.5529	-1.8923	-10.3411	-10.5408
LN(TTKTP)	-3.8099	-1.0388	-13.8997	-15.0558

Note. Researcher's Computation

Table 5

KPSS (Kwiatkowski–Phillips–Schmidt–Shin) Unit Root Test Results

Variable	I(0) Constant	I(0) Constant and Linear Trend	I(1) Constant	I(1)Constant and Linear Trend
DNKZTP	1.5435	0.1952	0.1707	0.0805
LN(DNKZTP)	1.7194	0.1385	0.3158	0.2427
ENF	1.6889	0.3646	1.0338	0.2612
LN(ENF)	1.7374	0.1888	0.3252	0.1618
GUVEN	0.8885	0.1679	0.111	0.0921
LN(GUVEN)	0.839	0.1523	0.0946	0.09
KKKTP	1.7247	0.2235	0.3901	0.0743
LN(KKKTP)	1.7043	0.3565	0.7002	0.1159
KKOUTP	1.2356	0.1409	0.0804	0.0711
LN(KKOUTP)	1.1619	0.2237	0.5485	0.1294
KKTP	1.7207	0.1939	0.3174	0.0737
LN(KKTP)	1.6989	0.3513	0.7316	0.1194
KRTP	1.6126	0.4176	1.0781	0.0543
LN(KRTP)	1.7196	0.3044	0.9298	0.1366
TATP	1.5532	0.3898	0.9222	0.1441
LN(TATP)	1.6861	0.0918	0.2584	0.0744
TBKKTP	0.1288	0.1315	0.3308	0.1333
LN(TBKKTP)	1.434	0.2257	0.2198	0.1142
TIKTP	1.3664	0.3151	0.3009	0.105
LN(TIKTP)	1.5063	0.2565	0.5047	0.1019
TKKTP	1.1878	0.2706	0.124	0.1066
LN(TKKTP)	1.1987	0.3833	0.6139	0.1479
TKRKTP	1.5307	0.3897	0.8634	0.1689
LN(TKRKTP)	1.656	0.2966	0.1572	0.0657
TKROUTP	1.705	0.3875	0.3133	0.1071
LN(TKROUTP)	1.5834	0.342	1.1901	0.2714
TKRTP	1.7024	0.3944	0.3869	0.0963
LN(TKRTP)	1.6312	0.3569	1.2329	0.2326
TTAKTP	0.4206	0.3313	0.3665	0.1043
LN(TTAKTP)	0.6821	0.3646	0.9677	0.2268
TTKTP	1.6	0.2773	0.2508	0.0975
LN(TTKTP)	1.5374	0.3641	0.8392	0.1104
DNKZTP	1.5435	0.1952	0.1707	0.0805

Note. Researcher's Computation

The confirmation of stationarity in the levels of all variables, as indicated by the Dickey-Fuller Unit Root Test (Table 3), Phillips-Perron Test (Table 4), and KPSS Unit Root Test (Table 5), is a pivotal outcome in the data analysis process. This verification not only serves to prevent

the time series from trending but also guards against the risk of spurious regression, ensuring the robustness of subsequent statistical analyses and model applications.

Analysis of the Effect of Variables on Profitability

The dependent variable in this study was the period net profit and loss, and its relationship with other variables was examined. First, the logarithms of the variables were taken and analyzed. The net profit loss for the period was seasonally adjusted. Separate analyses were conducted using AIC (Akaike information criteria) and SIC (Schwarz-Bayesian information criteria), and a table of AIC and SIC was added just below. These criteria were used to choose the most suitable model among the models with different AIC criteria. SIC criteria are also quite similar to AIC criteria and are valid not only for the selected sample size but also for future predictions. The number of lags was determined by AIC and SIC criteria.

Table 6 presents the results of the model performed with different lag levels (up to a maximum of 2) and model selection optimization based on the Akaike Information Criteria (AIC) for the long term. According to the results, the model that was performed gave the smallest AIC result at ARDL(1, 0, 0, 0, 0, 2, 1, 1, 2, 2, 1, 0, 0, 2, 0, 1) lag lengths.

Table 6
ARDL Long Run Model (AIC)

ARDL Long Run Form and Bounds Test
Dependent Variable: D(DNKZTPSALOG)
Selected Model: ARDL(1, 0, 0, 0, 0, 2, 1, 1, 2, 2, 1, 0, 0, 2, 0, 1)
Case 2: Restricted Constant and No Trend
Date: 05/13/20 Time: 13:42
Sample: 2004M01 2018M12
Included observations: 169

Conditional Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.929975	2.452332	1.602546	0.1113
DNKZTPSALOG(-1)*	-0.313158	0.064948	4.821656	0.0000
ENFLOG**	-0.391549	0.479907	-0.815885	0.4160
GUVENLOG**	0.210819	0.130506	1.615402	0.1085
KKKTPLOG**	-3.478480	2.288379	-1.520063	0.1308
KKOUTPLOG**	0.020696	0.066977	0.308995	0.7578
KKTPLOG(-1)	3.058145	2.231863	1.370221	0.1728
KRTPLOG(-1)	0.547163	0.407272	1.343484	0.1813
TATPLOG(-1)	0.277382	0.255161	1.087087	0.2789
TBKKTPLOG(-1)	-0.669276	0.259990	-2.574241	0.0111
TIKTPLOG(-1)	0.005283	0.091187	0.057940	0.9539
TKKTPLOG(-1)	-0.097937	0.071000	-1.379395	0.1700
TKRKTPLOG**	0.173483	0.126468	1.371751	0.1723
TKROUTPLOG**	0.991425	0.928831	1.067390	0.2876
TKRTPLOG(-1)	-1.380821	1.162417	-1.187888	0.2369
TTAKTPLOG**	0.098479	0.135236	0.728197	0.4677
TTKTPLOG(-1)	0.376416	0.250765	1.501070	0.1356
D(KKTPLOG)	3.958805	2.397471	1.651242	0.1009
D(KKTPLOG(-1))	0.948793	0.548631	1.729384	0.0859
D(KRTPLOG)	-0.840995	0.440828	-1.907763	0.0585
D(TATPLOG)	-0.469339	0.494539	-0.949042	0.3442
D(TBKKTPLOG)	-0.039337	0.232413	-0.169256	0.8658
D(TBKKTPLOG(-1))	0.278881	0.200120	1.393568	0.1657
D(TIKTPLOG)	-0.267106	0.126190	-2.116704	0.0361
D(TIKTPLOG(-1))	-0.204189	0.113819	-1.793971	0.0750
D(TKKTPLOG)	-0.530048	0.151191	-3.505827	0.0006
D(TKRTPLOG)	-0.189818	1.251953	-0.151617	0.8797
D(TKRTPLOG(-1))	-2.104685	0.614775	-3.423504	0.0008
D(TTKTPLOG)	-0.139553	0.381109	-0.366175	0.7148

* p-value incompatible with t-Bounds distribution.
** Variable interpreted as Z = Z(-1) + D(Z).

Note. Researcher's Computation

As can be seen from Table 6, the cointegration equation of the model, which does not include the constant term and a trend coefficient, is found to be statistically significant. After this stage, the model is also estimated for the level equation.

The most appropriate ARDL model determined according to the AIC values presented in Table 6, the level equation is formed with the short-term in Table 7. When the bounds test is performed accordingly, the F-statistic value presented in Table 8 is compared with the threshold values in the Pesaran (2001), the null hypothesis claiming that there is no relationship in the level

equation, is rejected since it is even higher than the value at the highest limit of the I(0) - I(1) band according to Pesaran (2001).

Table 7
ARDL Level Equation (AIC)

Levels Equation
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ENFLOG	-1.250324	1.553002	-0.805102	0.4221
GUVENLOG	0.673205	0.398325	1.690091	0.0932
KKKTPLOG	-11.10776	6.885432	-1.613227	0.1089
KKOUTPLOG	0.066087	0.215979	0.305988	0.7601
KKTPLOG	9.765513	6.761335	1.444317	0.1509
KRTPLOG	1.747245	1.301683	1.342297	0.1817
TATPLOG	0.885760	0.780154	1.135366	0.2582
TBKKTPLOG	-2.137187	0.831376	-2.570663	0.0112
TIKTPLOG	0.016871	0.291127	0.057952	0.9539
TKKTPLOG	-0.312740	0.244608	-1.278534	0.2032
TKRKTPLOG	0.553978	0.419291	1.321226	0.1886
TKROUTPLOG	3.165897	2.973090	1.064851	0.2888
TKRTPLOG	-4.409349	3.737703	-1.179695	0.2401
TTAKTPLOG	0.314470	0.431032	0.729573	0.4669
TTKTPLOG	1.202003	0.830015	1.448171	0.1498
C	12.54951	8.093541	1.550559	0.1233

EC = DNKZTPSALOG - (-1.2503*ENFLOG + 0.6732*GUVENLOG -11.1078
*KKKTPLOG + 0.0661*KKOUTPLOG + 9.7655*KKTPLOG + 1.7472
*KRTPLOG + 0.8858*TATPLOG -2.1372*TBKKTPLOG + 0.0169
*TIKTPLOG -0.3127*TKKTPLOG + 0.5540*TKRKTPLOG + 3.1659
*TKROUTPLOG -4.4093*TKRTPLOG + 0.3145*TTAKTPLOG+1.2020
*TTKTPLOG + 12.5495)

Note. Researcher's Computation

The results of bounds test are given in the Table 8 according to its AIC-based application. Therefore, it is observed that there is a long-run cointegration relationship. Banks' net profit/loss for the period is mostly affected by total non-performing personal credit cards and confidence index at 5% significance level.

Table 8
ARDL Bound Test (AIC)

F-Bounds Test			Null Hypothesis: No levels relationship	
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	4.392936	10%	1.76	2.77
k	15	5%	1.98	3.04
		2.5%	2.18	3.28
		1%	2.41	3.61

Note. Researcher's Computation

In Figure 1, the cointegration graph obtained from this equation is presented, according to which banks' net profit / loss for the period moves together with all other independent variables in the long run.

Figure 1
2004-2018 AIC Cointegrating Equation

Note.Created by the author.

Equation 1 (ARDL) and Equation 2 (ECM) models were also performed according to Schwarz-Bayesian Information Criteria (SBIC) and are presented in Table 9 and Table 10.[4] Upon careful examination of Table 9, it becomes evident that the cointegration equation within the model holds statistical significance. Notably, this equation is devoid of the constant term and a trend coefficient. The observed statistical significance underscores the robustness and relevance of the model at this stage of analysis.

[4] The selection procedure of the best candidate model was given in Figure 4 in Appendix..

Table 9
ARDL Long Run Model (SBIC)

ARDL Long Run Form and Bounds Test
Dependent Variable: D(DNKZTPSALOG)
Selected Model: ARDL(1, 0, 0, 0, 0, 0, 1, 0, 0, 2, 1, 0, 0, 0, 0, 0)
Case 2: Restricted Constant and No Trend
Date: 05/13/20 Time: 13:49
Sample: 2004M01 2018M12
Included observations: 169

Conditional Error Correction Regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.196827	2.091548	-0.094106	0.9252
DNKZTPSALOG(-1)*	-0.288782	0.059313	-4.868810	0.0000
ENFLOG**	0.289087	0.456142	0.633765	0.5272
GUVENLOG**	0.174488	0.132735	1.314560	0.1907
KKKTPLOG**	-1.188540	2.103488	0.565033	0.5729
KKOUTPLOG**	0.050024	0.060283	0.829820	0.4080
KKTPLOG**	0.953020	2.070800	0.460218	0.6460
KRTPLOG(-1)	0.504936	0.342832	1.472835	0.1429
TATPLOG**	-0.105014	0.222094	-0.472833	0.6370
TBKKTPLOG**	-0.208966	0.205467	-1.017030	0.3108
TIKTPLOG(-1)	0.138888	0.080485	1.725631	0.0865
TKKTPLOG(-1)	-0.078787	0.068631	-1.147986	0.2528
TKRKTPLOG**	0.089273	0.119698	0.745818	0.4570
TKROUTPLOG**	-0.967163	0.779315	-1.241043	0.2166
TKRTPLOG**	0.630463	1.013675	0.621958	0.5349
TTAKTPLOG**	0.299144	0.120848	2.475381	0.0144
TTKTPLOG**	-0.032267	0.211183	-0.152791	0.8788
D(KRTPLOG)	-0.601247	0.438638	-1.370714	0.1725
D(TIKTPLOG)	-0.306289	0.118650	-2.581453	0.0108
D(TIKTPLOG(-1))	-0.241849	0.109234	-2.214051	0.0284
D(TKKTPLOG)	-0.562766	0.125350	-4.489574	0.0000

* p-value incompatible with t-Bounds distribution.
** Variable interpreted as Z = Z(-1) + D(Z).
Note. Researcher's Computation

According to the AIC values determined in Table 9, the most suitable Autoregressive Distributed Lag (ARDL) model was identified, and in Table 10, a short-term Error Correction Model (ECM) and level equation were constructed. Subsequently, during the conducted bound test, the F-statistic value presented in Table 11, when compared to the threshold values in Pesaran's (2001) article, surpassed even the upper limit of the I(0) - I(1) band. Consequently, the null hypothesis (H0), which claims no relationship in the level equation, is rejected. Thus, it is concluded that there is a long-term cointegration relationship. The net profit/loss of banks during the period is found to be most ınfluenced by the total outstanding ındividual credit card amount and the confidence ındex at a 5% significance level.

Table 10
ARDL Level Equation (SBIC)

Levels Equation
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ENFLOG	1.001056	1.592756	0.628505	0.5306
GUVENLOG	0.604219	0.431263	1.401047	0.1633
KKKTPLOG	-4.115701	7.083060	-0.581063	0.5621
KKOUTPLOG	0.173223	0.215915	0.802274	0.4237
KKTPLOG	3.300139	7.013001	0.470574	0.6386
KRTPLOG	1.748502	1.226951	1.425078	0.1562
TATPLOG	0.363643	0.799180	-0.455020	0.6498
TBKKTPLOG	-0.723612	0.677117	-1.068666	0.2870
TIKTPLOG	0.480943	0.277369	1.733946	0.0850
TKKTPLOG	-0.272825	0.251629	-1.084235	0.2800
TKRKTPLOG	0.309137	0.418577	0.738542	0.4614
TKROUTPLOG	-3.349112	2.864844	-1.169038	0.2443
TKRTPLOG	2.183180	3.575716	0.610557	0.5424
TTAKTPLOG	1.035881	0.446805	2.318417	0.0218
TTKTPLOG	-0.111734	0.729891	-0.153084	0.8785
C	-0.681578	7.253468	-0.093966	0.9253

EC = DNKZTPSALOG - (1.0011*ENFLOG+0.6042*GUVENLOG -4.1157
*KKKTPLOG + 0.1732*KKOUTPLOG + 3.3001*KKTPLOG + 1.7485
*KRTPLOG -0.3636*TATPLOG -0.7236*TBKKTPLOG + 0.4809
*TIKTPLOG -0.2728*TKKTPLOG + 0.3091*TKRKTPLOG -3.3491
*TKROUTPLOG + 2.1832*TKRTPLOG + 1.0359*TTAKTPLOG-0.1117
*TTKTPLOG -0.6816)

Note. Researcher's Computation

The F-statistic value presented in Table 11 is greater than the I(1) limit. Since the H0 hypothesis is rejected, it can be claimed that there is a long-term cointegration relationship. The total non-performing consumer loans seem to affect banks' net profit/loss for the period in this model at a 5% significance level. Cointegrating relation was drawn in Figure 2.

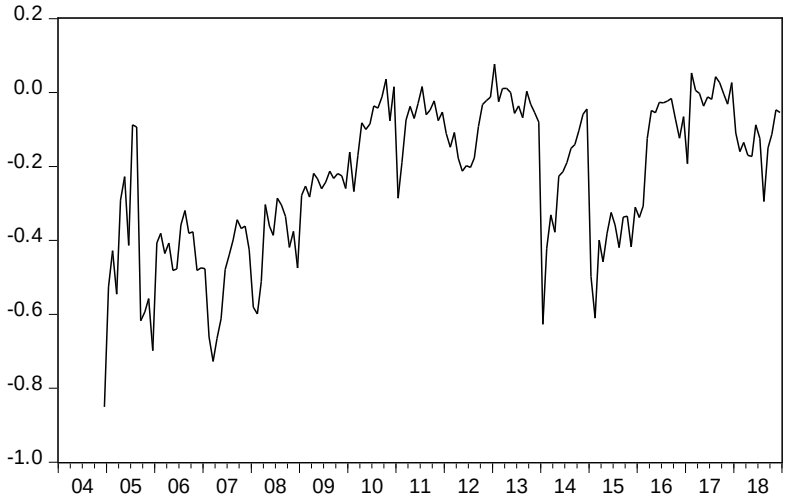
Table 11
ARDL Bound Test (SBIC)

F-Bounds Test — Null Hypothesis: No levels relationship

Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	5.080955	10%	1.76	2.77
k	15	5%	1.98	3.04
		2.5%	2.18	3.28
		1%	2.41	3.61

Note. Researcher's Computation

Figure 2
2004-2018 SBIC Cointegrating Equation



Note.Created by the author.

Conclusion

The primary objective of this research is to assess the influence of non-performing loans (NPLs) on the profitability of the banking industry in Turkiye. To comprehensively investigate the fundamental indicators of profitability, a dataset spanning the years 2004 to 2018 was compiled. This dataset encompasses non-performing receivables, consumer credit cards, non-performing housing and vehicle loans, non-performing consumer loans, consumer loans, loans and credit cards, net profit-loss, and non-performing loans.

Loans are defined as the funds given by banks to individuals or institutions in return for interest to be repaid after a certain maturity period (Black et al., 2009). Banks give loans under risk, as they want to collect the loans given on the basis of the payment agreements they have made, but the collection does not always take place on the due date, and delays may occur (Selimler, 2015). When customers cannot repay the loans on time, banks may restructure the loan to make it easier to repay, or initiate legal proceedings if necessary. Bad loans can shake the image of the bank in the market, decrease its competitive power, and negatively affect its growth. Administrative and legal extra costs for the collection of non-performing receivables will arise and the bank balance sheet and asset profitability will be adversely affected. The increase in non-performing loans will cause limited growth, which will reduce the willingness of employees and reduce work efficiency. The increase in non-performing loans will also cause the quality of the loan portfolio to decrease.

Non-performing loans have negative effects not only on the banking sector but also on the country's economy. Problematic loans reduce the profitability of banks, which causes them to increase their interest rates, leading to cost inflation. When the non-performing loan ratio increases, the financial situation of banks will suffer, and they will want to take this situation under control. Banks may stop giving new loans and want to obtain their receivables in a short time. This situation affects companies and can cause economic recession. When banks demand their receivables from their customers, the cash flow of even companies that have not been in financial distress will deteriorate. In this way, companies will suffer from liquidity problems,

and the economy will be adversely affected. Therefore, banks need to research their customers in detail and obtain collateral before giving loans.

Given the diverse integration levels of the obtained series, we employed models based on the autoregressive distributed lag (ARDL) approach, a recognized time series regression method. This method facilitated a thorough analysis of the relationships between the mentioned variables. Specifically, we examined the impact of non-performing receivables on the profitability of the banking sector.

The preliminary findings underscore a noteworthy outcome: an escalation in non-performing receivables is associated with a substantial reduction in the profit margins of the banking sector. These outcomes illuminate a crucial dimension of the dynamic relationship between non-performing loans and the financial well-being of the banking industry, contributing valuable insights to the broader discourse on financial stability and risk management.

References

Aka, K. (2019). Banka Karlılığının Belirleyicileri: Türk Bankacılık Sektöründeki Katılım Bankaları Üzerine Ampirik Bir Uygulama. *Social Sciences Research Journal, 8* (3), 21-39.

Akhtar, M. F., Ali, Khizer & Sadaqat Shama. (2011). Factors Influencing the Profitability of Islamic Banks of Pakistan. *International Research Journal of Finance and Economics,* 60, 125-132.

Aktaş, R. (2000) Sorunlu Kredilerde Erken Uyarı Modelleri, *TBB Eğitim ve Tanıtım Grubu Seminer Notları*, İstanbul, 10-11 Şubat 2000,15-16

Alper, D., Anbar A.(2011). Bank Specific and Macroeconomic Determinants of Commercial Bank Profitability: Empirical Evidence From Turkey, *Business and Economics Research Journal, 2* (2), 139-152

Aydın, N. (2006). *Bankacılık Uygulamaları*. Anadolu Üniversitesi Yayınları

Bashir, A.H (2003). Determinants of Profitability in Islamic Banks: Some Evidence from The Middle East. *Islamic Economic Studies, 11*(1), 31-57.

Black,, J, Hasmınzade N. & Myles, G. (2009). *Dictionary of Economics*. Third Edition, USA,Oxford.

Bodla, B.Singh, & Verma, R. (2006). Determinants of profitability of banks in India: A multivariate analysis. *Journal of Services Research, 6*(2), pp. 75-89.

Enders, W. (2008). Applied econometric time series.

Greene, W. H. (2003). *Econometric Analysis*. Pearson Education India.

Gülhan, Ü., & Uzunlar, E.(2011). Bankacılık Sektöründe Kârlılığı Etkileyen Faktörler: Türk Bankacılık Sektörüne Yönelik Bir Uygulama/Factors Influencing the Bank Profitability: an Apllication on Turkish Banking Sector. *Atatürk Üniversitesi Sosyal Bilimler Enstitüsü Dergisi, 15*(1).

Güneş N,. (2015). Banka Kârlılığının Belirleyicileri: 2002-2012 Dönemi Türk Mevduat Bankaları Üzerine Bir İnceleme. *Süleyman Demirel Üniversitesi İktisadi ve İdari Bilimler Fakültesi Dergisi, 20*,(3),265-282.

Hamilton, J.D. (1994). *Time Series Analysis* Princeton University Press

Iqbal, S., & Nosheen, S. (2023). Moderating impact of non-performing loans on the relationship between sustainable development goals and the financial performance of banks. *Future Business Journal, 9*.

Karamustafa, C. (2013), *Türk Bankacılık Sektöründe Sorunlu Kredilerin Analizi Ve Uygulamaya Yönelik Politika Önerileri*, Yayınlanmamış Yüksek Lisans Tezi, Galatasaray Üniversitesi

Kjosevski, J., & Petkovski, M. (2021). Macroeconomic and bank-specific determinants of non-performing loans: The case of Baltic States. *Empirica*, 48, 1009–10281.

Kütük, Y. (2011). *Türkiye'de İntiharların Ekonomik ve Sosyal Göstergelerle İlişkisi.* Yayınlanmamış Yüksek Lisans Tezi. İstanbul Teknik Üniversitesi

Kwiatkowski, D. Phıllıps, P. C, Schmıdt, P., & Shın, Y. (1992). Testing the null hypothesis of stationarity against the alternative of a unit root. *Journal of Econometrics, 54*(1-3), pp. 159-178.

Majumder, T. H. ve Uddin, M. J. (2017). "The Determinants of Profitability of Nationalised Banks in Bangladesh". International *Journal of Economics and Business Research, 13*(4), 335-348.

Manz, F. (2019). Determinants of non-performing loans: What do we know? A systematic review and avenues for future research. *Management Review Quarterly*, 69(4), 351–3891.

Messai, A. S., & Jouini, F. (2013). Micro and Macro Determinants of Non-performing Loans. *Economics Research International, 3*(4), 852–860.

Nikolopoulos, K. I., & Tsalas, A. I. (2017). *Non-performing Loans: A Review of the Literature and the International Experience.* Palgrave Macmillan Studies in Banking and Financial Institutions.

Osuagwu, E. (2014). Determinants of Bank Profitability in Nigeria. *International Journal of Economics and Finance, 6*(12), 46-63.

Pesaran, M. H., Shın, Y., & Smıth, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics, 16*(3), 289-326.

Selimler, H. (2015). Sorunlu Kredilerin Analizi, Banka Finansal Tablo Ve Oranlarına Etkisinin Değerlendirilmesi *Finansal Araştırmalar ve Çalışmalar Dergisi 7*(12), 131-172

Sufıan, F., & Chong, R. R. (2008). Determınants Of Bank Profitability In A Developing Economy: Empirical Evidence From The Philippines. *Asian Academy of Management Journal of Accounting & Finance, 4*(2). 91-112

Şahbaz, N. (2010), *Türk Bankacılık Sektöründe Sorunlu Krediler ve Makroekonomik Etkileri: Türkiye Örneği* Yayınlanmamış Yüksek Lisans Tezi Afyon Kocatepe Üniversitesi

Syed, A.A. (2021), "Determinants of Nonperforming Loans: A Review of Empirical Evidence", Özen, E., Grima, S. and Gonzi, R.D. (Ed.) New Challenges for Future Sustainability and Wellbeing (Emerald Studies in Finance, Insurance, and Risk Management), *Emerald Publishing Limited*, pp. 277-306. https://doi.org/10.1108/978-1-80043-968-920211015.

Vogiazas, S., & Nikolaidou, E. (2011). The determinants of non-performing loans in commercial banks. In Advances in Banking and Finance (pp. 1–15), *Springer*.

Yuca, H. (2012), *Bankacılık Sektöründe Takipteki Krediler-Teminat İlişkisi: Türk Bankacılık Sektörü Üzerine Bir Uygulama* YayınlanmamışDoktora Tezi, Kadir Has Üniversitesi.

Appendix

Appendix 1:

Figure 3

Selection of the Best Appropriate Model in AIC

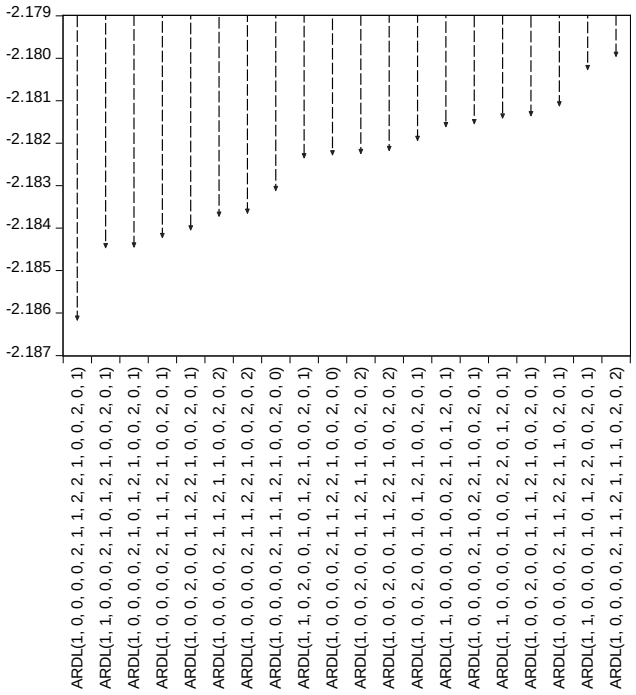
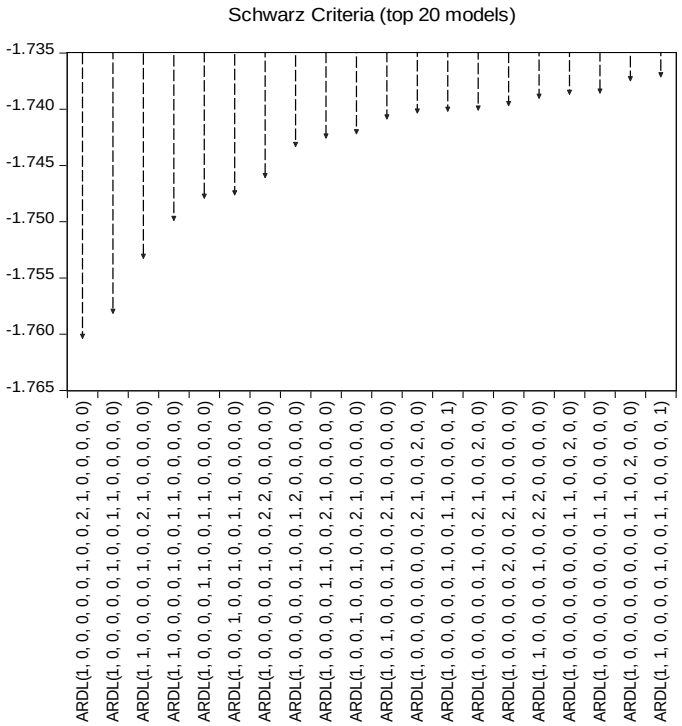


Figure 4

Selection of the Best Appropriate Model in AIC



Information About the Article/Makale Hakkında Bilgiler

The Ethical Rules for Research and Publication / Araştırma ve Yayın Etiği

The authors declared that the ethical rules for research and publication followed while preparing the article.

Yazarlar makale hazırlanırken araştırma ve yayın etiğine uyulduğunu beyan etmiştir.

Conflict of Interests/ Çıkar Çatışması

The authors have no conflict of interest to declare.

Yazarlar çıkar çatışması bildirmemiştir.

Grant Support/ Finansal Destek

The authors declared that this study has received no financial support.

Yazarlar bu çalışma için finansal destek almadığını beyan etmiştir.

Author Contributions/ Yazar Katkıları

The draft process of the manuscript/ Taslağın Hazırlanma Süreci Y.K./A.Ç.Y., Data Collection/Verilerin Toplanması Y.K./A.Ç.Y, Writing The Manuscript/ Makalenin Yazılması Y.K./A.Ç.Y., Submit, Revision and Resubmit Process/ Başvuru, Düzeltme ve Yeniden Başvuru Süreci Y.K./A.Ç.Y.

Journal of Applied and Theoretical Social Sciences

JATSS, 2024; 6(1), 50-73

First Submission:07.02.2024
Revised Submission After Review: 28.03.2024
Accepted For Publication: 30.03.2024
Available Online Since: 31.03.2024

Research Article

Financial Performance and Bankruptcy Risk Analysis: An Application on Private Health Insurance Companies in Turkey[a]

Neslihan Karavar[b] &Kemal Yaman[c]

Abstract

This research evaluates the correlation between the financial performances of seven insurance companies operating in Turkey from 2018 to 2022 and their risk of bankruptcy. In the study, data obtained from the year-end financial statements of the companies were used, weights were assigned to the criteria determined by the ENTROPY methodology, and the performance rankings of the companies were obtained using the WASPAS method. The Altman-Z model was applied to determine the risk of bankruptcy. The decisive criteria in the financial performance ranking are profitability ratios such as Asset Profitability, Equity Profitability, and Net Profit Margin. While Turkey Insurance and Anadolu Insurance's leadership positions in the sector were identified, Ray Insurance and Mapfre Insurance were determined as the companies showing the weakest performance. Although the research shows that financial performance affects the risk of bankruptcy, it also reveals that it is not the sole factor in determining the likelihood of bankruptcy. In this context, the evaluation of financial performance in the insurance industry should be considered as part of a more holistic risk assessment approach.

Keywords: insurance companies, financial performance, insolvency risk

JEL Codes: G15, G22, G52

[a] This article was produced from the master's thesis titled "Financial Performance and Bankruptcy Risk Analysis: An Application on Private Health Insurance Companies in Turkey" submitted to Mersin University, Institute of Health Sciences, Department of Healthcare Management.

[b] Master of Science in Health Management, Independent Researcher, Mersin/Turkey, neslihankaravar72@gmail.com, ORCID ID: https://orcid.org/0009-0002-2250-8393 (Corresponding Author).

[c] Doç. Dr., Mersin Üniversity, Faculty of Health Sciences, Department of Health Management, Mersin/Turkey, kyaman@mersin.edu.tr, ORCID ID: https://orcid.org/0000-0003-1267-9228.

Journal of Applied and Theoretical Social Sciences

JATSS, 2024; 6(1), 50-73

İlk Başvuru: 07.02.2024
Düzeltilmiş Makalenin Alınışı: 28.03.2024
Yayın İçin Kabul Tarihi:30.03.2024
Online Yayın Tarihi:31.03.2024

Araştırma Makalesi

Finansal Performans ile İflas Riski Arasındaki İlişkinin Analizi: Türkiye'deki Özel Sağlık Sigorta Firmaları Üzerine Bir Uygulama [a]

Neslihan Karavar [b] & Kemal Yaman[c]

Öz

Bu araştırma, 2018 ila 2022 yılları arasında Türkiye'de faaliyet gösteren yedi sigorta şirketinin finansal performanslarının iflas riski ile olan korelasyonunu değerlendirmektedir. Araştırmada, şirketlerin yıl sonu mali tablolarından elde edilen veriler kullanılmış, ENTROPİ metodolojisi ile belirlenen kriterlere ağırlıklar atfedilmiş ve WASPAS yöntemi ile şirketlerin performans sıralamaları elde edilmiştir. İflas riskinin belirlenmesinde ise Altman-Z modeli uygulanmıştır. Finansal performans sıralamasında belirleyici olan kriterler; Aktif Karlılık, Özsermaye Karlılığı ve Net Kâr Marjı Gibi karlılık rasyolarıdır. Türkiye Sigorta ve Anadolu Sigorta'nın sektördeki lider konumları saptanırken, Ray Sigorta ve Mapfre Sigorta ise en zayıf performansı gösteren şirketler olarak tespit edilmiştir. Araştırma, finansal performansın iflas riskini etkilediğini göstermekle beraber, bunun iflas olasılığını belirlemede tek faktör olmadığını ortaya koymaktadır. Bu bağlamda, sigorta endüstrisinde finansal performansın değerlendirilmesi, daha bütüncül bir risk değerlendirme yaklaşımının parçası olarak ele alınmalıdır.

Anahtar Kelimeler: sigorta şirketleri, finansal performans, iflas riski.

JEL Kodlar: G15, G22, G52

[a] Bu makale Mersin Üniversitesi Sağlık Bilimleri Enstitüsü Sağlık Yönetimi Anabilim Dalı'na sunulan "Finansal Performans ve İflas Riski Analizi: Türkiye'de Özel Sağlık Sigorta Şirketleri Üzerine Bir Uygulama" başlıklı yüksek lisans tezinden üretilmiştir.

[b] Sağlık Yönetimi Bilim Uzmanı, Bağımsız Araştırmacı, Mersin/Türkiye, neslihankaravar72@gmail.com, ORCID ID: https://orcid.org/0009-0002-2250-8393 (Sorumlu Yazar).

[c] Doç. Dr., Mersin Üniversitesi, Sağlık Bilimleri Fakültesi, Sağlık Yönetimi Bölümü, Mersin/Türkiye, kyaman@mersin.edu.tr, ORCID ID: https://orcid.org/0000-0003-1267-9228.

Introduction

Financial performance and bankruptcy risk are crucial factors in terms of the sustainability and future success of businesses. In this context, examining the relationship between these two factors is of great importance in industries with high financial uncertainties and risks, such as the health insurance sector. Especially in Turkey, private health insurance companies operate in a dynamic competitive environment, undertaking a significant responsibility in preserving their financial performance.

This study aims to analyze the relationship between the financial performance and bankruptcy risk of private health insurance companies in Turkey. Financial performance is a metric used to evaluate companies' financial conditions, profitability, and growth potentials. On the other hand, bankruptcy risk is a measure used to determine the likelihood of a company facing payment difficulties. The main objective of this study is to understand the relationship between financial performance and bankruptcy risk and examine the interaction between these two factors in the private health insurance sector. This analysis provides a significant perspective on determining the financial health of health insurance companies and anticipating adverse situations in the future. Additionally, it offers valuable guidance to stakeholders, managers, and regulators in the health insurance sector for making strategic decisions to improve financial performance and reduce bankruptcy risk. This study also aims to contribute to the literature on financial performance and bankruptcy risk in the health insurance sector. The findings obtained will create a general understanding and awareness in the academic environment and serve as a foundation for future research.

Furthermore, in this analysis, financial ratios will be calculated using the Income Statement, Balance Sheet, Cash Flow Statements, and other financial reports of relevant insurance companies. Initially, various financial ratios will be employed to measure financial performance. Liquidity Ratios will assess the ability of companies to meet short-term payment obligations. Profitability Ratios will indicate how much of the sales companies generate as profit, while Activity Ratios will measure the use of assets and operational efficiency. Additionally, ratios such as Leverage Ratios, Return on Equity, and Debt Coverage Ratios will help evaluate different aspects of financial performance. Subsequently, the Altman-Z score model will be used to assess bankruptcy risk. The Altman-Z model is a predictive method used to determine the financial health and measure bankruptcy risk of companies. This model calculates a score by combining financial ratios, helping determine the bankruptcy risk of a company. If the Altman-Z score is above or below a certain threshold, the company's bankruptcy risk is considered low or high, respectively.

In conclusion, this study aims to analyze the relationship between the financial performance and bankruptcy risk of private health insurance companies in Turkey. Financial conditions of companies will be assessed, and bankruptcy risk will be determined using financial ratios and the Z-Score model in the analysis. The findings obtained will play a crucial role in understanding the financial health and future risks of companies operating in the health insurance sector. This study aims to provide stakeholders, managers, and regulators in the industry with important guidance to make strategic decisions for improving the financial performance and reducing bankruptcy risk of health insurance companies.

Literature Review

The insurance sector plays a critical role in maintaining economic balance and trust. Therefore, the relationship between the financial performance and bankruptcy risk of insurance companies represents a significant research area to understand the sustainability and resilience

of the sector. Effective performance assessment is crucial for both internal management and stakeholders in the industry to make financial decisions, manage risks, and predict companies' future success. In this context, this section of the study will include a review of other works in the literature.

Opler and Titman's 1994 study addresses the relationship between financial distress and financial performance, observing that companies with high debt levels experience a decline in market share and equity market values compared to their competitors during periods of financial difficulty. This result supports a positive and significant relationship between financial distress and indirect costs. The research also indicates that the negative effects of debt are more pronounced in large-scale industries, suggesting that financial leverage can have different effects depending on sector size.

The study by Campbell et al, (2011) aims to predict the financial condition and performance of firms with distressed and failing stocks between 1991 and 2008, using market and accounting data-based measurement methods. The analysis shows that distressed stocks offer volatile returns and carry high risk, with an interesting finding that investors have not been able to achieve the expected extra returns despite these high risks. These findings indicate that the potential returns from investing in firms at risk of financial failure are not offset by the risks associated with these investments.

Tan (2012) study examines the connection between financial failures and performance of 277 firms from 8 East Asian countries during the financial crisis, measuring financial performance by asset profitability ratios and Tobin’s Q values, and financial distress by leverage. The results show that firms with low debt ratios performed better than those with high leverage, especially during crisis periods, indicating that high leverage firms tend to perform worse in such challenging times. This situation reveals that borrowing can create leverage effects for firms but can also lead to financial instability and liquidity problems, negatively affecting their performance. During crisis periods, the debt burden can increase financial difficulties and bankruptcy risk, highlighting the need for companies to follow a balanced debt management strategy to maintain their financial stability.

The study by Yusuf et al, (2014) aims to examine the relationship between financial failures and performance of local banks operating in Malaysia from 1990 to 2010, assessing financial performance by the equity profitability ratio and financial failure by the ratio of loan loss provisions to total debts. The results indicate a statistically significant negative relationship between financial failure and performance, showing that banks experiencing financial difficulties have lower performance and that increased loan losses negatively affect banks' equity profitability.

In Shahwan's (2015) study conducted on 86 non-financial firms listed on the Egyptian Stock Exchange, the aim was to reveal the impact of corporate governance index scores on financial performance and financial failure. Financial performance was measured using the Tobin's Q ratio in the study, while financial failure was calculated using the Altman Z-Score. The analysis results indicated that the corporate governance levels of the companies were low. Additionally, a positive relationship between corporate governance and financial performance was not found, and a statistically insignificant negative relationship between financial failure and corporate governance was observed. In other words, a significant connection between Tobin's Q ratio, which evaluates firm performance, and corporate governance was not identified, but a meaningful relationship between financial failure and corporate governance was not observed.

Shaukat and Affandi (2015) study examined the impact of financial distress on financial performance among 15 fuel and energy companies listed on the Pakistan Karachi Stock Exchange from 2007 to 2012. Financial performance was measured through asset profitability ratio, the ratio of prior year's profit to total assets, and the ratio of working capital to total assets, while financial distress was assessed using the Altman Z-Score. The results indicated a statistically significant negative relationship between financial distress and performance, demonstrating that firms with high Altman Z-Scores have lower financial distress risk and thus higher financial performance. This study supports the significant finding that financial robustness positively affects firms' economic performance.

Delavar et al, (2015) study investigated the relationship between financial performance, working capital, and financial distress for 71 companies traded on the Tehran Stock Exchange from 2004 to 2012. Financial performance was measured by Tobin's Q value, and financial distress was assessed using the Altman Z-Score. The analysis found no significant relationship between financial distress, working capital, and financial performance, indicating that in the examined period and sample, working capital management and financial distress risk did not directly affect firms' Tobin's Q value. This finding suggests the need to reevaluate the role of working capital management in determining financial performance and distress risk.

Kaygun, et al, (2016) study highlighted the importance of financial strength for businesses to achieve their goals, emphasizing that financial distress predictions are crucial for companies to foresee future financial risks and take appropriate measures. The research analyzed data from annual financial reports of 143 manufacturing industry companies continuously active on Borsa Istanbul between 2010 and 2013, using Data Mining and Logistic Regression Analysis techniques to predict financial success and failure situations. Models were created for one, two, and three-year retrospective predictions starting from 2013, and their prediction capabilities, i.e., classification accuracies, were compared. The analysis found that the predictive power of the models was highest for the year 2012 in forecasting financial success and failure situations.

In the study by Ege, Topaloğlu, and Erkol (2017), the aim is to uncover the relationship between financial failure and financial performance. In this context, data from manufacturing industry firms listed on the Borsa Istanbul 100 Index for the period 2011-2015 were examined using panel data analysis. Financial failure was expressed using the Fulmer H-Score, while financial performance was measured by Tobin's Q ratio. Additionally, control variables such as asset profitability ratio, logarithm of sales, and price/earnings ratio, believed to affect financial performance, were included in the analysis. The analysis results revealed a positive and significant relationship between the Fulmer H-Score and Tobin's Q ratio. In other words, as the level of financial failure of firms decreases, financial performance and firm value increase. Moreover, the study found a positive and significant relationship between asset profitability, price/earnings ratio, and Tobin's Q. However, no significant relationship was identified with the control variable of firm size.

The objective of Bülbül and Köse's (2016) study is to conduct a detailed examination of the financial performance of non-life insurance companies operating in the Turkish Insurance Sector. The application of the research is based on four years of balance sheet data from 2010 to 2013. During this period, 34 companies for the year 2010 and 35 companies for the subsequent three years were included in the analysis. The financial performance of companies in the relevant sector was evaluated in detail using the Promethee method, allowing for a comparative analysis of companies in the sector. The study explored factors affecting financial data after the period of 2010-2013, with a focus on significant events such as the December 17,

2013 investigation and exchange rate fluctuations in 2014. Understanding the potential impacts of such changes on the financial performance of companies in the Turkish insurance sector strengthens the purpose of the study. Ultimately, this research is expected to contribute significantly by providing a perspective that evaluates the financial performance of non-life branches in the Turkish insurance sector over various years, demonstrating sensitivity to sector changes, and guiding future studies.

Kula, et al (2016) study aims to examine the financial performance of eight insurance companies traded on the Borsa Istanbul using the Grey Relational Analysis (GRA) method. The research, conducted as a field study applying the GRA method to evaluate the performance of these eight companies using end-of-year 2013 data. According to the results of the study, identifiable factors contribute to achieving successful financial performance among insurance companies. These factors include maintaining a robust capital structure, keeping equity levels high, effectively preserving liquidity levels, and increasing profitability.

In Li and Wu's (2018) study conducted on 60 insurance companies in the Chinese insurance sector, it was observed that failing insurance companies exhibited unstable growth, low liquidity, high financial risk, and low profitability. Additionally, the study identified the impact of macroeconomic variables, where inflation rate, interest rate, and money supply were determined as significant macroeconomic variables in predicting the bankruptcy of insurance companies.

Karadeniz, et al, (2021) study evaluated the financial performance of businesses in the paper and paper products manufacturing sector in Turkey from 2009 to 2019 according to their size. The study conducted ratio analysis on the financial statements of micro, small, medium, and large enterprises using sectoral balance sheet data provided by the Central Bank of Turkey. The financial distress risks of the enterprises were also measured using the Altman Z score and Springate Z score models. The findings indicated that as the size of the enterprises increased, their liquidity, financial structure, and profitability performance improved, though operational performance varied with scale. It was also found that micro-scale enterprises in the sector were at high financial distress risk, while financial distress risk decreased as business size increased.

Pehlivan and Akpınar (2022) study starts with the premise that any failure or adversity in the insurance sector can significantly impact a country's financial systems. It is stated as an important matter that the performance of the insurance sector, which provides significant contributions to national economies, should be regularly measured and evaluated. In this context, the study aims to analyze the performance of non-life insurance companies, which hold a large share in the Turkish insurance sector. The performance of 33 non-life insurance companies operating in the Turkish insurance sector between 2015 and 2019 was thoroughly examined. The Grey Entropy method was used to determine the weight scores of the evaluation criteria, and the performance scores of the companies were calculated using the COPRAS (Complex Proportional Assessment) method. According to the Grey Entropy method, the findings revealed that the Return on Equity Ratio had the highest impact on performance during the examined period. BNP Paribas Insurance Company was identified as the best-performing company in the period based on the COPRAS method. These analyses provide a significant contribution to objectively assessing the performance of companies in the non-life insurance sector. According to the results of this study, the Return on Equity Ratio, an important criterion for determining the performance of insurance companies, usually indicates negative or low values in companies that rank lower in the evaluation. This observation suggests that these companies have weak financial conditions or low profitability. It implies that more effective investment evaluation, better resource allocation, and stricter cost controls could be crucial in

enhancing overall performance. Careful management of investments, effective use of resources, and strict financial controls can positively influence critical metrics like the Return on Equity Ratio. Therefore, reviewing financial strategies and addressing potential weaknesses could be a critical step for companies to improve their overall performance.

In the study of Öcek, et al, (2023) the effects of the Covid-19 pandemic on the financial condition and bankruptcy risk of travel agencies and tour operators in Turkey were examined. Based on real sector data from the Central Bank of Turkey, the economic performance and bankruptcy risk of the sector for the years 2018-2020 were assessed. The economic condition of the sector was analyzed through liquidity, asset management, financial structure, and profitability ratios, while bankruptcy risk was measured using models such as the Altman Z Score, Fulmer H Score, Springate Score, and Ohlson Score. The findings indicated that during the pandemic, travel agencies and tour operators faced serious cash flow problems, increased debt levels, higher financial costs, and incurred losses. Furthermore, the sector was found to be at risk of bankruptcy during this period.

Karaçayır (2024) study aims to empirically assess the effects of exchange rate risk on businesses' financial success, stock earnings, and profit margins. Using data for quarterly periods from 2014 to 2022, the study analyzed the impact of currency risk on the financial performance of 23 companies listed in the BIST Information Technologies Index using panel data analysis. Exchange rate risk was measured by the ratios of Net Foreign Exchange Position / Equity and Net Foreign Exchange Position / Total Assets, while company performance was assessed using asset profitability, Tobin's Q value, and stock returns. The research was supported by analyses using three different models. Empirical findings suggest that exchange rate risk negatively affected the profitability of the companies but had a positive effect on stock returns; its impact on company performance was found to be insignificant. Additionally, it was observed that company size positively influenced both profitability and performance but had no significant effect on stock returns. The leverage ratio had a negative impact on company profitability and performance, while its effect on stock returns was insignificant. It was concluded that the growth rate positively influenced company profitability, but had no significant effect on company performance and stock returns.

Method And Analysis

In this study, the performance ranking of 7 insurance companies operating in Turkey (Allianz Insurance, Anadolu Insurance, Axa Insurance, Groupama Insurance, Mapfre Insurance, Ray Insurance, and Turkey Insurance) is aimed to be determined based on selected criteria to identify their success levels. The Weighted Aggregated Sum Product Assessment (WASPAS) method, a multi-criteria decision-making approach, is employed to rank the insurance companies' performance. The criteria chosen for the study are assigned weight degrees using the Entropy method, and subsequently, the WASPAS method is utilized for performance ranking based on the importance degrees of the criteria's weights.

Another method used in this study is the Altman-Z Score method. The Altman-Z Score method is a significant tool in financial analysis and risk assessment. Developed by Edward I. Altman in 1968, this method is particularly used to predict the risk of bankruptcy for companies. The Z score includes four fundamental financial ratios (Working Capital/Total Assets, Retained Earnings/Total Assets, Earnings Before Tax/Total Assets, and Market Value/Total Liabilities) to evaluate a company's financial health and determine the risk of bankruptcy. The result, often referred to as the Z score, indicates the financial health of the company. The Z Score method holds a crucial place in the financial world and is used by investors, lenders, and financial analysts to assess companies' financial health and identify risks.

Entropy Method

The concept of entropy was first defined by Rudolph Clausius in 1865 as a measure of uncertainty and disorder in systems (Schall & Haley, 1983). Today, it has become a significant concept in physics, mathematics, engineering, and various other scientific disciplines. The entropy method was introduced by Shannon in 1948 within Information Theory to measure the amount of useful information provided by existing data (Ross et al., 2005). This method has the capability to be applied from a single structural group to the entirety of a structure.

Another important feature of the entropy method is its acceptance as a non-objective evaluation method in aesthetic assessments. It is also used to analyze information related to structural forms (Akgüç, 2006). In this way, the entropy method can assess the order or disorder in complex datasets, evaluate information content, and be applicable in different fields.

The entropy method consists of five steps, outlined as follows (Ross et al., 2005):

Step 1: In the first step, the alternatives and criteria to be applied are determined. This involves defining alternative options to evaluate performance and the criteria to assess these options. Subsequently, a decision matrix is created using the identified alternatives and criteria. The decision matrix is a table containing performance values of each alternative on every criterion. This initial step establishes the foundation for the data and information used in subsequent steps, facilitating the progression of the analysis process.

Step 2: In this step, the normalization process of the decision matrix is carried out, and the PIJ value is calculated. These values represent the relative weights of alternatives. This step ensures the acquisition of data necessary for performance ranking.

$$p_{ij} = \frac{x_{ij}}{\sum_{j=1}^{n} x_{ij}} \qquad \forall_i,\ j \qquad (1)$$

$p_{ij;}$ Normalized Values
$a_{ij:}$ Given Benefit Value
$i_{:}$ Alternatives
$j_{:}$ Criteria

Step 3: In this step, the entropy value of subset ej is calculated. Entropy serves as a measure of the homogeneity or heterogeneity level of performance values for a criterion. The performance values of alternatives in subset ej undergo a normalization process, and the entropy value is computed. This value signifies the level of disorder or uncertainty in the performance of alternatives within subset ej. This step provides crucial information for weighting the criteria.

$$e_j = -k \sum_{j=1}^{n} [p_{ij} \cdot \ln/(p_{ij})]; \qquad \forall_j \qquad i=1,2,3,\ldots m \text{ ve } j=1,2,3,\ldots n \qquad (2)$$

k: Entropy Coefficient $(\ln(n))^{-1}$
e_{ij} : Entropy Value
p_{ij} : Normalized Value

Step 4: In this step, the uncertainty of dj is calculated. dj uncertainty computes the degree of uncertainty between different levels of a criterion. Probability values are calculated using the numbers of alternatives at each level. dj uncertainty is then determined using these probability values. dj uncertainty measures the variance or uncertainty between different levels of the criterion. This step plays a crucial role in weighting the criteria.

$d_j = 1 - e_j \; ; \quad \forall_j$ (3)

Step 5: In this step, wj weight values are calculated to determine the importance level of criterion j. Weight values express the significance of criterion j relative to other criteria. wj weight value is obtained using entropy and dj uncertainty values. This value determines the relative importance of the criterion.

$$w_j = \frac{d_j}{\sum_{j=1}^{n} d_j} \quad (4)$$

WASPAS Method

The Weighted Aggregated Sum Product Assessment (WASPAS) method was developed by Zavadskas and colleagues in 2012. It comprises a combination of the Weighted Sum Model (WSM) and the Weighted Product Model (WPM) methods (Kumar and Singh, 2018). This method is designed to enhance ranking accuracy and is utilized in multi-criteria decision-making problems (Almajali et al., 2012). By merging the WSM and WPM methods, the total relative importance of each alternative can be calculated, leading to more accurate rankings. Unlike other methods in the field of multi-criteria decision-making, WASPAS method possesses a flexible structure and can be applied to decision-making problems with different scales.

The WASPAS method is completed in 5 steps, as outlined below (Almajali et al., 2012):

Step 1: In the first step of the WASPAS method, a decision matrix is created. The decision matrix is a table containing the performance values of alternatives with respect to criteria. This table forms the basis for the data used in the analysis process, providing an objective foundation for the decision-making process. This step plays a fundamental role in processes such as weighting criteria and performance ranking.

Step 2: In this stage, normalization of the decision matrix is performed, taking into account the benefit and cost criteria. Values in the matrix are appropriately adjusted, considering the interaction between criteria. This allows for an objective comparison and accurate evaluation of performance.

The equation used for the benefit criterion is:

$$x_{ij} = \frac{x_{ij}}{Max_{x_{ij}}} \quad (5)$$

The equation used for the cost criterion is:

$$x_{ij} = \frac{Min_{x_{ij}}}{x_{ij}} \quad (6)$$

Step 3: The calculation of the total relative preference of an alternative based on the Weighted Sum Model (WSM) is explained in the context of the WASPAS method, which relies on two equality criteria and seeks simultaneous optimism. In this method, the total relative preference of the i-th alternative is calculated by multiplying the weight value for each criterion with the performance value of the i-th alternative for that criterion. Subsequently, the total relative value preference for each alternative is computed in order.

$$Q_1 = \sum_{j=1}^{n} x_{ij}\, w_{ij} \qquad (7)$$

Step 4: Total relative importance values for alternative i are calculated based on the Weighted Product Model (WPM). The normalized decision matrix is used for this calculation. The values obtained for each criterion of alternative i are calculated by taking the power of the corresponding criterion weights, and the resulting values for each alternative are multiplied sequentially to obtain the Q2 value.

$$Q_2 = \prod_{j=1}^{n} {x_{ij}}^{w_{ij}} \qquad (8)$$

Step 5: In this stage, the weighted average criterion value for the methods employed in calculating the weighted total general criterion value is expressed by the following formula:

$$Q = \lambda \sum_{j=1}^{n} x_{ij}\, w_{ij} + (1-\lambda) \prod_{j=1}^{n} {x_{ij}}^{w_{ij}}\ , \qquad \lambda = 0, \ldots, 1. \qquad (9)$$

The WASPAS method allows for a transition between the Weighted Sum Model (WSM) and the Weighted Product Model (WPM) through the parameter λ. When λ = 0, the WASPAS method transforms into the WPM, and when λ = 1, it transforms into the WSM. In this way, a balance is achieved between different weighting methods in the evaluation of alternatives. The WASPAS method is particularly employed in multi-criteria decision-making problems, enhancing the reliability of ranking results.

Altman-Z and Bankruptcy Risk

In 1968, Altman designed a new model using the Multiple Discriminant Analysis method based on data from 66 publicly traded companies in the United States operating in 66 different manufacturing sectors. Out of the selected sample of 66 companies, 33 had gone bankrupt between 1946 and 1968, while the remaining 33 continued their operations successfully. Altman's Z-Score model, developed during a period when traditional ratio analysis was losing popularity in academic circles, has become widely used for predicting financial distress (Altman et al., 2007).

Altman determined financial coefficients based on the financial indicators of businesses and developed a new approach using these coefficients in the Z-Score model. Over the last 40 years, this method has become a significant tool for assessing credit risks and analyzing the future financial conditions of businesses. Studies have shown that the model has a high success rate in predicting bankruptcy. For instance, it can predict bankruptcy with a success rate of 72% for the previous two years, increasing to 94% for the previous year. Furthermore, tests conducted over 31 years after the model's development demonstrated that even non-bankrupt firms could be classified correctly in the range of 80-90%, and bankruptcy risk could be detected up to one year in advance (Akdoğan & Tenker, 2010). Therefore, Altman's Z-Score model is widely accepted as an effective tool in financial risk analysis.

The Z-Score model, created by Altman, utilizes seven values, including six accounting-based and one market-based, to form five fundamental ratios. Altman's Discriminant formula, developed using Multiple Discriminant Analysis, has gained significant interest among analysts and practitioners because each ratio in the formula provides valuable information about different aspects of the company's operations (Akdoğan & Tenker, 2010). As a result, the Z-Score model is considered an essential tool in various financial analyses.

Despite Altman's Z model being praised as a successful tool for predicting business bankruptcy, the prediction model has faced significant criticisms over time. These critiques primarily target the Multiple Discriminant Analysis method used in constructing the model, rather than the success level of the model itself. Critics point out that the fundamental assumptions of the Multiple Discriminant Analysis method in this particular study have not been thoroughly tested. However, later studies have shown that the prediction model is "robust," meaning it remains effective in achieving the desired results even when some assumptions are not met. These studies play a crucial role in evaluating the Altman-Z model (Ross et al., 2005). Thus, research indicates that Altman's model remains an effective analysis tool.

In calculating the Z score in the service sector, four different financial ratios are used, and each ratio is calculated by multiplying it with coefficients specific to the model. These ratios are referred to as X variables and are multiplied by coefficients determined by the effects of businesses' success status, as determined by Discriminant analysis, during the model development process (Akdoğan & Tenker, 2010).

In the service sector, the Z" score for the Z Score method is calculated as follows: (Akgüç, 2006):

$$Z" = 6{,}56.X1 + 3{,}26.X2 + 6{,}72.X3 + 1{,}05.X4$$

X1: The ratio of net working capital to total assets
X2: Ratio of undistributed profits to total assets
X3: The ratio of earnings before interest and taxes to total assets
X4: The ratio of market value to total liabilities

In this formula, X1, X2, X3, and X4 represent financial indicators. Each indicator is multiplied by the coefficients stated in the formula to calculate the total Z" value. This formula is considered a criterion used to evaluate bankruptcy risk in the Altman-Z method.

Financial success levels are determined based on Altman-Z scores. A insurance company is considered financially successful if its Altman-Z score is $Z" \geq 2.6$, while it is considered in the 'grey zone' if the score is between $1.1 < Z" < 2.6$. If the Z" value is 1.1 or less, the company is considered financially unsuccessful. These evaluations are considered a criterion used to analyze companies' bankruptcy risk and to assess their financial performance.

Analysis Results

This study aims to assess the financial performance and bankruptcy risk of 7 insurance companies in Turkey between the years 2018-2022. The insurance companies included in the analysis are Allianz Insurance, Anadolu Insurance, Axa Insurance, Groupama Insurance, Mapfre Insurance, Ray Insurance, and Turkey Insurance. The evaluation of the companies' performance employs the Entropy and WASPAS methods. These methods utilize financial metrics such as profitability ratios, activity ratios, leverage ratios, and liquidity ratios to analyze the performance of the companies.

Additionally, the Altman-Z model method has been utilized to calculate the bankruptcy risk of insurance companies. This model aims to predict potential bankruptcy risks by evaluating the financial condition of insurance companies. The calculations provide an approach to analyzing the financial condition of companies to determine bankruptcy risk and create a performance ranking. The obtained results are utilized to compare the financial situations of insurance companies, analyze their performances, and determine bankruptcy risks.

Consequently, the performance ranking of the 7 insurance companies in Turkey is revealed, intending to monitor developments in the sector and provide valuable information to decision-makers.

Table 1

Financial Ratios Related to Criteria

Financial Ratios	*Codes*	*Explanation*
	K1	Return on Equity (ROE)
Profitability Ratios	K2	Return on Assets (ROA)
	K3	Net Profit Margin
	F1	Asset Turnover
Activity Ratios	F2	Equity Turnover
	F3	Net Working Capital Turnover
	KO1	Total Debt Ratio
Leverage Ratios	KO2	Debt-to-Equity Ratio
	KO3	Asset Ratio
	L1	Current Ratio
Liquidity Ratios	L2	Cash Ratio
	L3	Current Assets to Total Assets Ratio

Note. Created by the author.

In order to conduct a financial performance ranking of seven insurance companies operating in Turkey, it is first necessary to calculate the weights of the criteria using the ENTROPY methodology. Table 1 presents a thorough examination of the criteria to be used in the ENTROPY and WASPAS methodologies for the mentioned companies. The selection of these criteria was made by taking into account the opinions of industry experts and relevant recommendations in the literatüre. These; Yurdoğlu and Kundakçı (2017), Ural, Demireli and Güler (2018), Akçakanat, Eren, Aksoy and Ömürbek (2017). The purpose of preparing Table 1 is to define the evaluation criteria for each criterion and the weighting procedures. The meticulous definition and weighting of these criteria are important in ensuring the objectivity and reliability of the performance evaluation process. Consequently, this table should be regarded as a fundamental step towards analyzing the performance of companies operating in the insurance sector in an objective and comparable manner.

The entropy method decision matrix is presented in Table 2. This matrix is a table created based on the criteria determined for the decision-making problem. In this table; alternatives are placed on the horizontal axis, criteria on the vertical axis, and each cell indicates the value of the alternative according to that criterion. This stage is a method effectively used in multi-criteria decision-making problems and is one of the most fundamental steps in the analysis process.

Table 2

Decision Matrix of Insurance Companies for the Year 2018

Decision Matrix for the Relevant Insurance Companies Based on Criteria for the Year 2018

	K1	K2	K3	F1	F2	F3	KO1	KO2	KO3	L1	L2	L3
Allianz Insurance	0,223	0,033	0,101	0,323	2,212	2,348	0,854	5,852	0,285	1,482	0,583	0,423
Anadolu Insurance	0,246	0,043	0,053	0,812	4,662	5,566	0,826	4,744	0,798	1,183	0,674	0,944
Axa Insurance	0,343	0,055	0,079	0,706	4,367	4,463	0,838	5,184	0,810	1,195	0,215	0,968
Groupama Insurance	0,417	0,166	0,511	0,326	0,817	0,682	0,601	1,507	0,376	2,272	0,956	0,854
Mapfre Insurance	0,030	0,006	0,008	0,737	3,920	5,012	0,812	4,316	0,783	1,188	0,395	0,930
Ray Insurance	0,134	0,031	0,055	0,557	2,434	2,918	0,771	3,368	0,726	1,263	0,796	0,917
Türkiye Insurance	0,238	0,058	0,260	0,221	0,914	1,962	0,758	3,129	0,742	1,152	0,788	0,855
TOTAL	1,632	0,391	1,066	3,682	19,325	22,952	5,460	28,099	4,520	9,735	4,407	5,890

Note. Researcher's Computation

The second step in the analysis process is the normalization stage. The normalization process is calculated using formula (1). In this context, the data in Table 2 are normalized to obtain Table 3. In this step, the values in the decision matrix can be measured on different scales and in different units. For an objective evaluation to be conducted, these values need to be on the same scale. Accordingly, the value of each cell in the decision matrix is normalized between the best and worst performance values for that criterion among the alternatives. These normalized values take a value in the range of 0-1. This process ensures that an objective comparison can be made.

Table 3

Normalized Decision Matrix of Insurance Companies for the Year 2018

Normalized Values of the Relevant Insurance Companies Based on Criteria for the Year 2018

	K1	K2	K3	F1	F2	F3	KO1	KO2	KO3	L1	L2	L3
Allianz Insurance	0,137	0,083	0,095	0,088	0,114	0,102	0,156	0,208	0,063	0,152	0,132	0,072
Anadolu Insurance	0,151	0,109	0,050	0,220	0,241	0,243	0,151	0,169	0,177	0,121	0,153	0,160
Axa Insurance	0,210	0,142	0,074	0,192	0,226	0,194	0,154	0,184	0,179	0,123	0,049	0,164
Groupama Insurance	0,256	0,425	0,479	0,089	0,042	0,030	0,110	0,054	0,083	0,233	0,217	0,145
Mapfre Insurance	0,019	0,015	0,007	0,200	0,203	0,218	0,149	0,154	0,173	0,122	0,090	0,158
Ray Insurance	0,082	0,078	0,052	0,151	0,126	0,127	0,141	0,120	0,161	0,130	0,181	0,156
Türkiye Insurance	0,146	0,147	0,244	0,060	0,047	0,085	0,139	0,111	0,164	0,118	0,179	0,145

Note. Researcher's Computation

Table 4 contains the entropy value (ej), uncertainty value (dj), and the weight values of the criteria (wj). The entropy values are calculated using formula (2), while the uncertainty value is calculated using formula (3). After calculating the uncertainty value, the weight values of the criteria are calculated using formula (4) and the resulting data are presented as the wj value in Table 4. Finally, the importance weight of each criterion is normalized by dividing it by the total weight of the criteria. In this way, the total importance level of each criterion is determined, and the decision-making process begins.

Table 4

Importance Weights of Criteria for Insurance Companies in the Year 2018

Importance Weights of Criteria for the Year 2018

	K1	K2	K3	F1	F2	F3	KO1	KO2	KO3	L1	L2	L3
$\mathbf{e_j}$	0,817	0,743	0,660	0,844	0,815	0,821	0,883	0,857	0,860	0,871	0,850	0,874
$\mathbf{d_j}$	0,183	0,257	0,340	0,156	0,185	0,179	0,117	0,143	0,140	0,129	0,150	0,126
$\mathbf{w_j}$	**0,087**	**0,122**	**0,162**	**0,074**	**0,088**	**0,085**	**0,055**	**0,068**	**0,066**	**0,061**	**0,071**	**0,060**

Note. Researcher's Computation

Table 5 shows the weight importance rankings of the criteria determined in 2018 for measuring financial performance. According to this evaluation, with a weight percentage of 16%, Net Profit Margin is considered an important financial indicator used to assess the profitability of an insurance company. This criterion indicates the difference between the company's revenues and expenses and is used as a significant indicator of financial soundness for investors. The second most influential criterion is Asset Profitability, with an impact rate of 12%. This criterion evaluates the profitability obtained by companies using their assets. Asset Profitability reflects a company's ability to manage its assets effectively.

According to the analysis results, the third highest criteria considered in evaluating the company's performance, with an impact rate of 9%, are Equity Profitability and Equity Turnover Rate. While Equity Profitability shows how profitably the company's equity is used, Equity Turnover Rate reflects how efficiently the company turns over its equity. These two criteria are important measures in terms of the company's use and efficiency of equity. Their position at third place with a 9% impact rate provides valuable information regarding the company's long-term profitability and capital usage.

The first fundamental step in performing a performance ranking using the WASPAS method is the creation of the decision matrix. Table 5 is calculated based on the criteria measures in Table 1, which are derived from the balance sheet data of the relevant insurance companies.

Table 5

WASPAS Method Decision Matrix of Insurance Companies for the Year 2018

Decision Matrix for the Relevant Insurance Companies in the Year

w_j	0,09	0,12	0,16	0,07	0,09	0,08	0,06	0,07	0,07	0,06	0,07	0,06
	K1	**K2**	**K3**	**F1**	**F2**	**F3**	**KO1**	**KO2**	**KO3**	**L1**	**L2**	**L3**
Allianz Insurance	0,223	0,033	0,101	0,323	2,212	2,348	0,854	5,852	0,285	1,482	0,583	0,423
Anadolu Insurance	0,246	0,043	0,053	0,812	4,662	5,566	0,826	4,744	0,798	1,183	0,674	0,944
Axa Insurance	0,343	0,055	0,079	0,706	4,367	4,463	0,838	5,184	0,810	1,195	0,215	0,968
Groupama Insurance	0,417	0,166	0,511	0,326	0,817	0,682	0,601	1,507	0,376	2,272	0,956	0,854
Mapfre Insurance	0,030	0,006	0,008	0,737	3,920	5,012	0,812	4,316	0,783	1,188	0,395	0,930
Ray Insurance	0,134	0,031	0,055	0,557	2,434	2,918	0,771	3,368	0,726	1,263	0,796	0,917
Türkiye Insurance	0,238	0,058	0,260	0,221	0,914	1,962	0,758	3,129	0,742	1,152	0,788	0,855
Max/Min	**0,417**	**0,166**	**0,511**	**0,812**	**4,662**	**5,566**	**0,601**	**1,507**	**0,285**	**2,272**	**0,956**	**0,968**

Note. Researcher's Computation

Considering the data in Table 5, benefit and cost criteria are taken into account. In this context, the normalized decision matrix in Table 6 is obtained using formulas (5) or (6). The values in the decision matrix can be measured in different scales and units. For an objective evaluation, these values need to be on the same scale. Therefore, the value of each cell in the decision matrix is normalized between the best and worst performance values for that criterion among the alternatives. The normalization process ensures a fairer comparison. This process is

carried out using the highest or lowest performance value in each criterion. As a result of normalization, a separate matrix is created for each criterion.

Table 6

Normalized Decision Matrix of Insurance Companies for the Year 2018 Using the WASPAS Method

Normalized Values for the Year 2018 Using the WASPAS Method

wj	0,087	0,122	0,162	0,074	0,088	0,085	0,055	0,068	0,066	0,061	0,071	0,060
	K1	**K2**	**K3**	**F1**	**F2**	**F3**	**KO1**	**KO2**	**KO3**	**L1**	**L2**	**L3**
Allianz Insurance	0,534	0,196	0,197	0,398	0,474	0,422	0,704	0,257	1,000	0,652	0,610	0,437
Anadolu Insurance	0,589	0,257	0,103	1,000	1,000	1,000	0,728	0,318	0,358	0,521	0,704	0,975
Axa Insurance	0,822	0,333	0,154	0,870	0,937	0,802	0,717	0,291	0,352	0,526	0,225	1,000
Groupama Insurance	1,000	1,000	1,000	0,402	0,175	0,123	1,000	1,000	0,759	1,000	1,000	0,882
Mapfre Insurance	0,073	0,034	0,015	0,909	0,841	0,900	0,740	0,349	0,365	0,523	0,413	0,961
Ray Insurance	0,321	0,184	0,108	0,687	0,522	0,524	0,780	0,447	0,393	0,556	0,833	0,947
Türkiye Insurance	0,570	0,346	0,509	0,273	0,196	0,353	0,793	0,482	0,385	0,507	0,824	0,883

Note. Researcher's Computation

Table 7 includes the Weighted Sum Model (Q1), Weighted Product Model (Q2), and WASPAS Value (Q). The Weighted Sum Model is calculated using formula (7) and the Weighted Product Model using formula (8). After calculating the Weighted Sum Model and Weighted Product Model, the WASPAS Value is calculated using formula (9).

In the Weighted Sum Model, the importance of each criterion is calculated by multiplying it with the criterion's weight, and then the sum of all ratios gives the Q1 values for each company. In the Weighted Product Model, the weight of each criterion is used as the exponent of the normalized value for that criterion, and the product of all criteria yields the Q2 value. For the calculation of the WASPAS Value, it is assumed that Q1 and Q2 values have the same importance, thus taking $\lambda = 0.5$

Table 7

Performance Ranking of Insurance Companies for the Year 2018 Using the WASPAS Method
Performance Ranking for the Year 2018 Based on the WASPAS Method

	Q1	Q2	Q	Arrangement
Allianz Insurance	0,442000703	0,388443331	0,415222017	6
Anadolu Insurance	0,572617715	0,445373097	0,508995406	2
Axa Insurance	0,543078915	0,446605251	0,494842083	3
Groupama Insurance	0,78559737	0,653913026	0,719755198	1
Mapfre Insurance	0,438779549	0,200594101	0,319686825	7
Ray Insurance	0,45908367	0,372235304	0,415659487	5
Türkiye Insurance	0,486608637	0,447387849	0,466998243	4

Note. Researcher's Computation

Table 7 shows the performance ranking of insurance companies for the year 2018. Accordingly, the insurance company with the highest performance is Groupama Insurance, followed by Anadolu Insurance in second place. In the performance ranking, Axa Insurance is third, Turkey Insurance fourth, Ray Insurance fifth, Allianz Insurance sixth, and Mapfre Insurance seventh.

This study covers the performance ranking between the years 2018-2022. The Entropy method and WASPAS method are used for the performance ranking in the study. The performance ranking for the year 2018 is examined in detail. In the subsequent parts of the study, the performance rankings of insurance companies for the years 2019-2022 are obtained using the same methods.

Table 8 includes a comprehensive representation of the weight values, obtained using the ENTROPY method, which express the changing importance of the determined criteria over time. This table quantitatively displays the extent to which each criterion has been prioritized during the analyzed time period, thereby allowing for the dynamic weighting of criteria in long-term performance evaluation studies.

Table 8

Insurance Companies' Criteria Weights
The Criteria Weight Values of Insurance Companies Calculated by the Entropy Method Over the Years, 2019-2022

wj	K1	K2	K3	F1	F2	F3	KO1	KO2	KO3	L1	L2	L3
2019	0,09	0,20	0,11	0,08	0,07	0,01	0,07	0,07	0,06	0,07	0,10	0,07
2020	0,09	0,10	0,09	0,08	0,09	0,09	0,06	0,08	0,08	0,07	0,12	0,07
2021	0,11	0,12	0,10	0,08	0,09	0,09	0,05	0,06	0,06	0,08	0,12	0,05
2022	0,12	0,07	0,06	0,06	0,12	0,13	0,05	0,11	0,06	0,08	0,10	0,05

Note. Researcher's Computation

The analysis of Table 8, created using the Entropy method, reveals that for the performance evaluation conducted in 2019, Asset Profitability took the lead in performance ranking with an impact rate of 20%, while in 2020 and 2021, the Cash Ratio and Asset Profitability became decisive in the ranking, each with equal impact rates of 12%. This situation reflects the increasingly significant importance of these two indicators in terms of companies' liquidity and profitability. By the year 2022, Net Working Capital has become the criterion with the strongest impact on performance ranking. This change indicates that the efficiency in the management of short-term assets and liabilities of insurance companies is gaining increasing weight in the evaluation of their performance.

Table 9 displays the annual performance evaluations of insurance companies in a ranked order based on the WASPAS multi-criteria decision-making method. This ranking is assessed separately for each year and is structured according to a set of performance metrics that represent the financial and operational successes of the companies for that year.

Table 9

Performance Ranking of Insurance Companies

Performance Ranking of Insurance Companies Using the WASPAS Method Between 2019-2022

	2019	**2020**	**2021**	**2022**
Allianz Insurance	4	6	3	3
Anadolu Insurance	3	2	4	2
Axa Insurance	6	3	1	1
Groupama Insurance	1	7	6	5
Mapfre Insurance	7	4	7	7
Ray Insurance	5	5	5	6
Türkiye Insurance	2	1	2	4

Note. Researcher’s Computation

Bankruptcy risk analysis is conducted using balance sheet data of insurance companies from 2018 to 2022 and data compiled from the Investing website. This analysis aims to assess and compare the bankruptcy risk of companies in the insurance sector. The calculations of bankruptcy risk are carried out using financial models and ratios, while factors such as the liquidity status, debt level, profitability, and operational efficiency of the companies are evaluated to determine a bankruptcy risk score. This analysis provides a crucial tool for understanding the financial health of companies in the insurance sector, identifying potential risks, and assessing overall trends in the industry.

Table 10

Altman-Z Bankruptcy Risk Values for the Year 2018

Altman-Z X1, X2, X3, and X4 values

	Allianz Insurance	**Anadolu Insurance**	**Axa Insurance**	**Groupama Insurance**	**Mapfre Insurance**	**Ray Insurance**	**Türkiye Insurance**
Fixed Assets	12.956.150.677	424.531.964	215.563.309	55.377.545	253.415.662	76.975.918	953.889.547
Current Assets	**9.491.211.320**	**7.152.455.785**	**6.477.278.766**	**322.965.783**	**3.364.766.240**	**849.696.589**	**5.617.112.827**
Total Assets	**22.447.361.997**	**7.576.987.749**	**6.692.842.075**	**378.343.328**	**3.618.181.902**	**926.672.507**	**6.571.002.374**
Short-Term Liabilities	**6.405.673.595**	**6.047.711.891**	5.418.317.222	142.160.773	2.832.408.392	672.772.065	**4.875.747.218**
Long-Term Liabilities	12.765.811.949	210.113.586	192.241.117	85.261.708	105.172.567	41.728.577	103.709.939
Total Liabilities	**19.171.485.544**	**6.257.825.477**	**5.610.558.339**	**227.422.481**	**2.937.580.959**	**714.500.642**	**4.979.457.157**
Market Value	**74.119.000.000**	**2.584.000.000**	**44.946.000.000**	**266.820.000**	**7.080.000.000**	**226.700.000**	**405.000.000**
Depreciation Expenses	-78.045.241	-29.160.345	-13.721.042	-1.298.584	-15.768.993	-4.830.281	-6.861.268
Interest Expenses	0	-304.105	-3.426.077	0	0	-1.019.586	-1.244.121
EBITDA	**652.653.084**	**295.042.526**	**354.133.327**	**61.689.106**	**4.987.422**	**22.541.663**	**370.408.773**
Net Working Capital	3.085.537.725	1.104.743.894	1.058.961.544	180.805.010	532.357.848	176.924.524	741.365.609
Retained Earnings	596.465.142	80.319.522	0	0	60.935.719	0	0
Net Profit/Loss for the Period	730.698.325	324.506.976	371.280.446	62.987.690	20.756.415	28.391.530	378.514.162
Undistributed Profits	134.233.183	244.187.454	371.280.446	62.987.690	-40.179.304	28.391.530	378.514.162
X1	0,137456585	0,145802518	0,158222999	0,47788608	0,147134075	0,190924542	0,112823823
X2	0,005979909	0,032227511	0,055474258	0,166482888	-0,011104833	0,030638149	0,057603717
X3	0,029074823	0,03893929	0,052912249	0,163050598	0,001378433	0,024325382	0,056370208
X4	3,866106246	0,412922989	8,010967409	1,173234936	2,410146341	0,317284529	0,081334167

Note. Researcher's Computation

For the fiscal years 2019-2022, selected accounting data from the financial statements of 7 insurance companies operating in Turkey and the values of X1, X2, X3 and X4 are calculated as shown in Table 10. The Z scores are presented in Table 11.

Table 11 presents a compilation of the criteria used to determine the bankruptcy risk levels of the examined insurance companies, based on the Altman-Z score analytical model. It quantitatively evaluates the bankruptcy risk over the years to provide a detailed perspective on the financial health of each insurance firm.

Table 11

Bankruptcy Risk Values of Insurance Companies

Bankruptcy Risk Values of Insurance Companies According to the Altman-Z method, 2018-2022

	2018	2019	2020	2021	2022
Allianz Insurance	5,176	5,012	3,743	9,653	5,299
Anadolu Insurance	1,757	1,804	1,996	1,180	1,698
Axa Insurance	9,986	11,735	8,809	10,062	6,701
Groupama Insurance	6,005	7,372	5,565	6,454	5,175
Mapfre Insurance	3,469	3,366	3,319	2,309	-117,699
Ray Insurance	1,849	2,073	3,065	2,437	1,725
Türkiye Insurance	1,392	1,447	3,493	2,526	1,688

Note. Researcher's Computation

Table 11 presents the results obtained using the Z-Score method. These results are based on the calculation of specific financial indicators representing each insurance company, multiplied by the coefficients specified in the Z-Score method. These calculations are conducted to assess the bankruptcy risk of each insurance company.

In the service sector, the formula used for the Z-Score method calculates the Z" as follows:

$Z'' = 6.56X1 + 3.26X2 + 6.72X3 + 1.05X4$

In this formula, X1, X2, X3, and X4 represent the financial indicators (Net Working Capital/Total Assets, Retained Earnings/Total Assets, Earnings Before Interest and Taxes (EBIT)/Total Assets, Market Value/Total Liabilities). Each indicator is multiplied by the coefficients specified in the formula to calculate the total Z" value. This formula is considered a measure used in the Altman-Z method for assessing bankruptcy risk.

Financial success levels are determined based on Altman-Z scores. A company is considered financially successful if its Altman-Z score is $Z'' \geq 2.6$, while scores in the range of $1.1 < Z'' < 2.6$ are considered the grey zone. If the Z" value is less than 1.1, the company is considered financially unsuccessful. These evaluations serve as a criterion for analyzing the bankruptcy risk of companies and assessing their financial performance.

Result and Recommendations

The insurance sector in Turkey plays a vital role in the financial system and holds a central position in risk management. This sector is crucial in mitigating various risks faced by companies and individuals, thereby maintaining a critical position within the financial system. Insurance companies need to continually update their decisions regarding financing, investment, and profit distribution under the influence of factors such as economic fluctuations, inflation, company size, indebtedness, and asymmetric information. This study primarily addresses the financial performance and subsequent bankruptcy risk of insurance companies.

Financial performance analyses aim to measure companies' performance, identify problems, and make improvements. These analyses help assess the companies' positions within

the sector and guide managers in making critical decisions. When evaluating multiple and often inconsistent criteria, methods like "Multi-Criteria Decision Making (MCDM)" analysis come into play. In this study, the WASPAS method was chosen, and the Entropy method was used to determine the criteria weights.

Financial failures affect not only businesses but also stakeholders such as shareholders, employees, and creditors. Therefore, financial health should be regularly monitored, bankruptcy probabilities should be determined, and solutions should be developed. The literature contains many models for assessing financial failure. These models analyze the financial status of businesses using financial ratios and other indicators, detecting risks beforehand and allowing for preventive measures. These approaches are critical in enhancing the sustainability of businesses, maintaining stakeholder trust, and effectively responding to crises.

This study analyzes the performance and bankruptcy risk of seven insurance companies in Turkey from 2018 to 2022. The analyses determined that profitability ratios are the main indicators of the financial success of insurance companies. Specifically, factors such as Asset Profitability, Equity Profitability, and Net Profit Margin significantly influenced the performance rankings of the companies. While Liquidity Ratios, like the Cash Ratio, were notably impactful in the performance ranking during 2020 and 2021, the Net Working Capital Turnover emerged as the most influential factor in 2022.

In the sector, Anadolu Insurance and Turkey Insurance were leading, with Axa Insurance and Groupama Insurance also holding significant positions. While Allianz Insurance's performance could not be distinctly classified as good or bad, Ray Insurance and especially Mapfre Insurance lagged in financial success.

In the second part of the study, the companies' bankruptcy risk was assessed using the Altman-Z Score Model. This model predicts the likelihood of bankruptcy by evaluating the financial health of companies through certain ratios. The assessment for the 2018-2022 period showed that Allianz Insurance, Axa Insurance, and Groupama Insurance did not carry bankruptcy risk. While Anadolu Insurance, Turkey Insurance, and Ray Insurance were not at the desired level of financial success, they did not carry bankruptcy risk, Mapfre Insurance was identified as financially unsuccessful, falling into the grey zone in 2021 and below the Z-Score of 1.1 in 2022.

This research was conducted by reviewing various studies in the existing literature. While supporting the general view that a company's performance can affect its bankruptcy risk, it emphasizes that this effect is not solely determinative. Although there is a significant relationship between business performance and bankruptcy risk, it is clear that other factors must be considered to understand this relationship. Thus, it can be said there is a significant relationship between performance and bankruptcy risk among large insurance companies, but this relationship should be viewed as just one element of a complex equation. To support this assertion, the following studies are referenced: [Opler and Titman (1994), Campbell, Hilscher, and Szilagyi (2011), Tan (2012), Yusuf, Karim, and Yunus (2014), Shahwan (2015), Shaukat and Affandi (205), Ege, Topaloğlu, and Erkol (2017), Öcek, Beyazgül, and Karadeniz (2023), and Karaçayır (2024)]. These studies demonstrate that the relationship between performance and bankruptcy risk needs to be viewed from a broad perspective, helping us understand the multifaceted factors affecting business sustainability.

References

Akçakanat, Ö., Eren, H. , Aksoy, E. and Ömürbek, V. (2017). Performance Evaluatıon By Entropy And Waspas Methods At Bankıng Sector. *Journal of Süleyman Demirel University Faculty of Economics and Administrative Sciences, 22*(2), s.285-300.

Akdoğan, N. ve Tenker, N. (2010). *Financial Statements and Techniques of Financial Analysis (11th Edition).* Ankara: Gazi Bookstore.

Akgüç, Ö. (2006). *Financial Statement Analysis*. İstanbul: Arayış Printing and Publishing

Almajali, A. Y., Alamro, S.A And Al-Soub, Y. Z. (2012). Factors Affecting The Financial Performance Of Jordanian Insurance Companies Listed Amman Stock Exchange. *Journal Of Management Research*, *4*(2), 266-289.

Altman, E. I. (2007). Predicting financial distress of companies: revisiting the Z-score and ZETA models. *Journal of Banking & Finance, 31*(6), 1524-1537.

Campbell, J., Hilscher, J. D. and Szilagyi, J. (2011). Predicting Financial Distress and The Performance of Distressed Stocks. *Journal of Investment Management, 9*(2), 14-34.

Ege, İ., Topaloğlu, E. E. and Erkol, A. Y. (2017). The Relationship between Financial Failure and Financial Performance Based on the Fulmer Model: An Application on the Manufacturing Industry. *Journal of Accounting and Finance, (74)*, 119-132.

Investing (2023, August 8) The market value of Groupama Insurance was obtained over the years. https://tr.investing.com/funds/groupama-mondactions.

Investing (2023, August 9). The market value of AXA Insurance was obtained over the years. https://tr.investing.com/pro/DB:AXA/explorer/marketcap.

Investing (2023, August 11). The market value of Türkiye Insurance was obtained over the years. https://tr.investing.com/pro/IBSE:TURSG/explorer/marketcap.

Investing (2023, August 12). The market value of Ray Insurance was obtained over the. https://tr.investing.com/pro/IBSE:RAYSG/explorer/marketcap.

Investing (2023, August 12). The market value of Anadolu Insurance was obtained over the https://tr.investing.com/pro/IBSE:ANHYT/explorer/marketcap.

Investing (2023, August 13). The market value of Mapfre Insurance was obtained over the https://tr.investing.com/pro/WBAG:MAP/explorer/marketcap_adj.

Investing (2023, August 13). The market value of Allianz Insurance was obtained over the. https://tr.investing.com/pro/XTRA:ALV/explorer/marketcap.

Karaçayır, E. (2023). The Relationship Between Exchange Rate Risk and Financial Performance in Companies Registered in BIST Informatics Index. *Doğuş University Magazine, 25*(1), 183-194.

Kumar, A., & Singh, S. (2018). Cash value added (CVA): A Better Performance Measure for Firms. *Management Research Review, 41*(3), 364-381.

Newton, W. G. (1989). *Bankruptcy and incolvency accounting practice and procedure (4th ed.).* John Wiley&Sons Inc., New York.

Öcek, C., Beyazgül, M. ve Karadeniz, E. (2023). The Impact of the Covid-19 Pandemic on Financial Performance and Risk of Financial Failure in the Travel Agency and Tour Operators Activities Sector. *Alanya Academic View*,*7*(1), 169-186.

Ross, A. S., Westefield, W. R., ve Jafee, J. (2005). *Corporate Finance (7th ed.)*. Mc Graw Hill, Singapore.

Schall, L., ve Haley C. W. (1983). *Financial Management (3th ed.)*. McGraw-Hıll Book Company, New York.

Shahwan, T. M. (2015). The effects of Corporate Governance on Financial Performance and Financial Distress: Evidence from Egypt. *Corporate Governance, 15*(5), 641-662.

Shaukat, A. ve Affandi, H. (2015). Impact of Financial Distress on Financial Performance to Pakistani Corporate Sector. *International Journal of Current Research, 7*(2), 12991-12996.

Tan, T. K. (2012). Financial Distress and Firm Performance: Evidence from the Asian Financial Crisis. *Journal of Finance & Accountancy, 11*, 36-45

Ural, M., Demireli, E. and Güler Özçalık, S. , (2018). Performance Analysis in Public Banks: An Application with Entropy and Waspas Methods. *Pamukkale University Social Sciences Institute Journal, 31*, 129-141

Yurdoğlu, H. and kundakçı, N., (2017). Server Selection with SWARA and WASPAS Methods. *Journal of Balıkesir University Social Sciences Institute, 38*, 253-269

Yusuf, M., Karim, Y. F. ve Yunus, F. M. (2014). Financial Distress and Performance Relationship of Banks in Malaysia. *5th Internatıonal Conference on Busıness and Economıc Research Proceedıng*, Kuchıng Sarawak, Malaysia.

Information About the Article/Makale Hakkında Bilgiler

The Ethical Rules for Research and Publication / Araştırma ve Yayın Etiği

The authors declared that the ethical rules for research and publication followed while preparing the article.

Yazarlar makale hazırlanırken araştırma ve yayın etiğine uyulduğunu beyan etmiştir.

Conflict of Interests/ Çıkar Çatışması

The authors have no conflict of interest to declare.

Yazarlar çıkar çatışması bildirmemiştir.

Grant Support/ Finansal Destek

The authors declared that this study has received no financial support.

Yazarlar bu çalışma için finansal destek almadığını beyan etmiştir.

Author Contributions/ Yazar Katkıları

The draft process of the manuscript/ Taslağın Hazırlanma Süreci N.K./K.Y., Data Collection/Verilerin Toplanması N.K./K.Y., Writing The Manuscript/ Makalenin Yazılması N.K./K.Y.,Submit, Revision and Resubmit Process/ Başvuru, Düzeltme ve Yeniden Başvuru Süreci N.K./K.Y.

Journal of Applied and Theoretical Social Sciences

JATSS, 2024; 6(1), 74-87

First Submission:27.04.2023
Revised Submission After Review:26.03.2024
Accepted For Publication:30.03.2024
Available Online Since:31.03.2024

Research Article

Effect of Remittance Inflow on the Economic Growth of Nigeria

Taiwo Owoeye[a] & Oluwatoyin Babatunde Omoniyi[b]

Abstract

This study examines the effect of remittance inflows on Nigeria economy as proxy with gross domestic product (GDP). The research specifically focuses on 41 years from 1981 to 2021, analyzing data from the Central Bank of Nigeria's statistical bulletin and the World Development Index. Through correlation analysis, unit root and co-integration tests, as well as error correction model estimation, the study investigates the relationship between remittance inflows and GDP growth. The results demonstrates that, in the short term, remittance inflows had an insignificant negative effect on Nigeria's GDP growth (-0.337970, $p > 0.05$). However, in the long run, remittance inflows shows a significant positive impact on the GDP growth rate (1.973835, $p < 0.05$). These findings highlight the importance of channeling remittances into productive activities within the home country. While short-term inflows may not contribute significantly to economic growth, sustained and increasing remittance inflows can play a crucial role in driving Nigeria's economic expansion. The study recommends the implementation of policies, programs, and systemic reforms to encourage the productive utilization of remittances. It emphasizes the need to ensure that remittances are utilized in ways that contribute to long-term economic growth and development. Furthermore, the study calls for the establishment of measures to prevent brain drain, protecting Nigeria's valuable human capital from being solely driven by financial incentives, which may not be evenly distributed for productive purposes in the short and medium term. These measures will help foster a balanced approach to leveraging remittance inflows for sustainable economic progress in Nigeria.

Keywords: remittance, economic growth, inflow, Nigeria

JEL Codes: F24,F22,C01, O47, O15

[a]Dr., Ekiti State Üniversity, Faculty of Social Sciences, Department of Economics, Ado Ekiti/ Nigeria,taiwo.owoeye@eksu.edu.ng,ORCID ID: https://orcid.org/0000-0001-6630-2050
[b]Lecturer, BamideleOlumilua Üniversity of Education Science and Technology, School of Social and Management Sciences, Department of Economics, Ikere Ekiti/Nigeria, omoniyi.oluwatoyin@bouesti.edu.ng, ORCID ID: https://orcid.org/0000-0001-9997-4013 (Corresponding Author)

Journal of Applied and Theoretical Social Sciences

JATSS, 2024; 6(1), 74-87

İlk Başvuru:27.04.2023
Düzeltilmiş Makalenin Alınışı:26.03.2024
Yayın İçin Kabul Tarihi:30.03.2024
Online Yayın Tarihi:31.03.2024

Araştırma Makalesi

Taiwo Owoeye[a] & Oluwatoyin Babatunde Omoniyi[b]

Öz

Bu çalışma, nakit girişlerinin Nijerya'nın ekonomik büyümesi üzerindeki etkisini incelemektedir. Çalışma, özellikle 1981'den 2021'e uzanan 41 yıllık bir süreye ait Dünya Kalkınma Endeksi ve Nijerya Merkez Bankası istatistik bülteninden elde edilen ikincil zaman serisi verilerini analize odaklanmıştır. Toplanan veriler, korelasyon analizi ve birim kök testi, eş bütünleşme testi ve hata düzeltme modeli tahmini ile analiz edilmiştir. Sonuç, kısa vadede nakit girişinin Nijerya'nın GSYİH büyümesi üzerinde önemsiz bir negatif etki yarattığını (-0.337970, $p > 0.05$), uzun vadede ise nakit girişinin GSYİH büyüme oranı üzerinde önemli bir pozitif etki yarattığını (1.973835, $p < 0.05$) göstermiştir. Bu çalışma, kısa vadede nakit girişinin, anavatandaki alıcıların üretken katılımına kanalize edilmediği takdirde, Nijerya'nın ekonomik büyüme düzeyine zarar verebileceğini ortaya koymuştur. Çalışma, para girişinin verimli kullanımını teşvik etmek için politikaların, programların ve sistemik reformların uygulanmasını tavsiye etmektedir. Para girişlerinin uzun vadeli ekonomik büyümeye ve kalkınmaya katkıda bulunacak şekilde kullanılmasının sağlanması ihtiyacını vurgulamaktadır. Ayrıca çalışma, Nijerya'nın değerli insan sermayesini, kısa ve orta vadede üretken amaçlar için eşit şekilde dağıtılamayabilecek fon akışıyla takas etmemek için beyin göçünü önleyecek tedbirlerin oluşturulması çağrısında bulunmaktadır. Bu önlemler, Nijerya'da sürdürülebilir ekonomik ilerleme için nakit girişlerinden yararlanmaya yönelik dengeli bir yaklaşımın geliştirilmesine yardımcı olacaktır.

Anahtar Kelimeler: para girişi, ekonomik büyüme, nakit girişi, Nijerya

JEL Kodlar: F24,F22,C01, O47, O15

[a]Dr., Ekiti State Üniversity, Faculty of Social Sciences, Department of Economics, Ado Ekiti/ Nigeria,taiwo.owoeye@eksu.edu.ng,ORCID ID: https://orcid.org/0000-0001-6630-2050
[b]Lecturer, BamideleOlumilua Üniversity of Education Science and Technology, School of Social and Management Sciences, Department of Economics, Ikere Ekiti/Nigeria, omoniyi.oluwatoyin@bouesti.edu.ng, ORCID ID: https://orcid.org/0000-0001-9997-4013 (Corresponding Author)

Introduction

Remittances are widely recognized as a critical component for nations worldwide due to their interconnection and reliance on resources, particularly human resources, which drive migration across international borders. It is a mechanism by which migrants' home countries benefit, particularly in terms of providing financial support to those who live there (Maqsood, Muhammad, & Chaudhary, 2016). Remittances are payments sent back to the place of origin by migrants, and these unreturned transfers generally alleviate poverty for the recipients, who are typically family members (Migration Development Brief, 2017; Zakaria & Normaz, 2020). When compared to revenue generated by exports, foreign aid, foreign direct investment, and other kinds of capital inflows, remittances contribute significantly to a country's foreign exchange earnings (Stanley & Buckley, 2016). Governments frequently create revenue through taxes and fees, and remittances are no exception, as various financial service fees and related taxes are earned at the international level, improving the country's exchange revenues (Iheke, 2012).

Many scholars have long associated remittances with migrant workers. However, with the advent of globalization, remittances are increasingly related not just to earner movement but also to the residential status of both earners and employers. Remittances are reported in the balance of payments of countries around the world, including Nigeria, based on the residency status of workers in the host country. Remittance transactions are classified into two types. The first is worker remittance, which refers to cash transferred to the home country by persons who have relocated to a foreign country that is geographically separate from their home country (Emmanuel & Micheal, 2013). The second type arises when individuals receive money from employers in foreign countries while remaining in their native country. This is known as personal remittance or employee compensation. In this instance, all revenues are remitted totally to the home country. Earnings are partially remitted to the home country based on the preference of the migrated individual. As a result, disaggregating remittance indicators in empirical studies is necessary to acquire a better knowledge of their influence on growth prospects and provide deeper insights into harnessing them for greater economic growth in the country. A more full knowledge of the impact of remittances can be obtained by looking at them from several angles.

Empirical evidence on the impact of remittances on economic results in Nigeria is limited. Various studies' findings give contradictory perspectives. Remittances, for example, have been proven by Anetor (2019), Loto and Alao (2019), and others to have a detrimental influence on economic growth in both the short and long run. Emmanuel and Michael (2013), Iheke (2012), and Ubi and Essien (2018), on the other hand, think that remittances have a beneficial effect on economic growth. These disparities could be due to variances in the growth and remittance indicators used, the data period chosen, and the analytical methodology used. Notably, these studies concentrate on aggregate remittances (remittances as a percentage of GDP) or disaggregated remittances (personal or worker remittances), as well as various indices for measuring economic growth, such as GDP per capita or GDP asymmetry. Furthermore, the sorts of data used in the studies vary, with several of them lacking recent year data. Given these differences in findings, it is critical to thoroughly examine the influence of remittances on Nigerian economic growth.

In addition to the preceding analyzes, this study thoroughly explores the impact of remittance inflows on Nigeria's economic growth in both the short and long ranges

Review of Literature

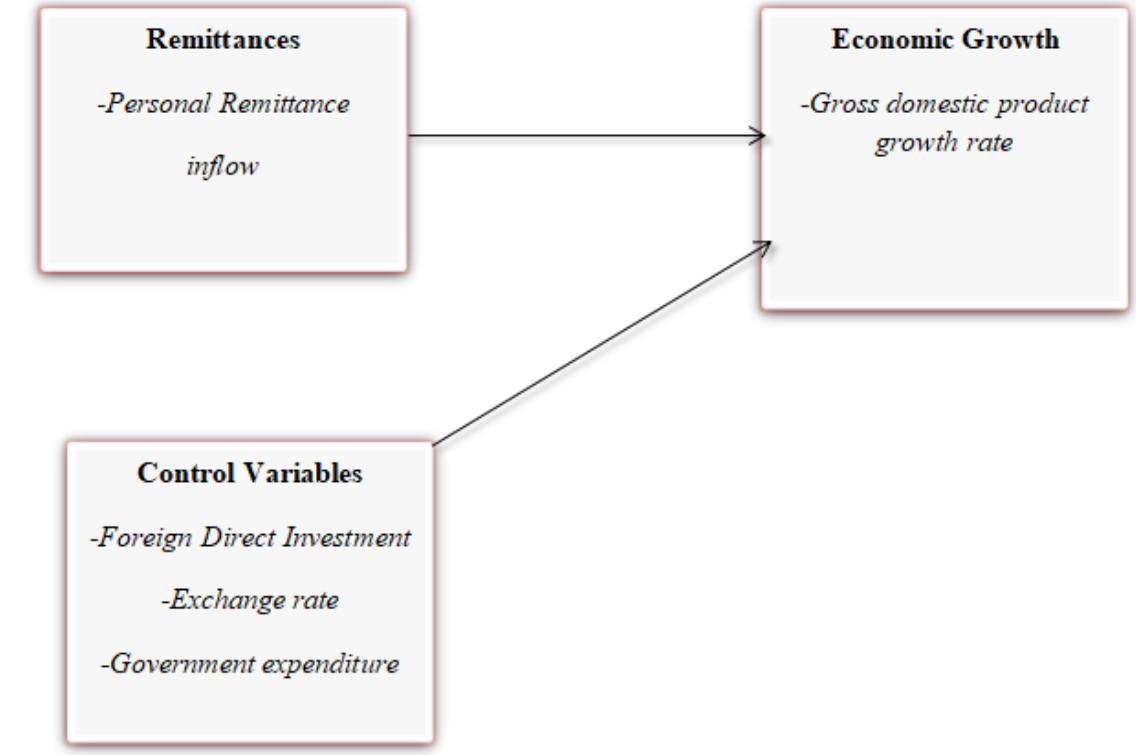
Inflow of Remittances

Remittances are cash sent home from abroad by migrants in exchange for earnings. Remittances are the monetary and physical resources gained and obtained by migrants while trading abroad and sent to persons or relatives in the home country, according to Tewolde (2005). According to Chami et al. (2008), remittances are individual trades between families across borders rather than market-based exchanges. According to Larsson and Angman (2014), remittances are part of the money earned by workers working abroad and given back to their families in their home country.From a similar standpoint, remittances are household income from other nations acquired primarily from temporary or permanent migration of people to those countries. Remittances are monetary and non-cash things that migrate across borders via formal or informal routes, such as electronics, money, or products (IMF). Remittances are primarily sourced from two balance-of-payments items: income earned by workers in non-resident economies (or from non-resident employers) and transfers from residents of one economy to residents of another.According to this, remittances are divided into two categories: personal remittances and labor remittances. Personal remittance occurs when migrants make money in their country of residence, their employers are also residents, and a portion of their earnings are remitted to their home country; the funds sent are considered personal remittance. Workers/remittances, on the other hand, indicate the amount earned by non-migrants in the country, that is, within the geographical boundary of their home country, but from employers who are not residents of the country.

Economic Growth.

Economic growth is defined as the increase in goods and services produced in a country over the course of a year in comparison to the previous year. It can also be defined as the annual rise in the total value of goods and services produced in a country. Economic growth is a measure of aggregate economic progress at the national level. Economic growth may also be described as a sustained increase in a country's output of goods and services. Economic growth may also be defined as a persistent increase in the output of goods and services by a country. Similarly, Muritala and Taiwo (2011) defined economic growth as a rise in an economy's capacity to provide a wider range of commodities to its population. Economic growth can also be defined as an increase in output that is not accompanied by any institutional or technological improvements (Kindleberger, 1965, cited in Okpe, 2013). Jinghan (2007) defines economic growth as a sustained increase in a country's per capita income, accompanied by an increase in consumption, labor force, and trade volume, among other things. As a result, various measures such as GDP, GDP per capita, and GDP growth rate (whether nominal or real) have been developed and used in empirical research to capture economic growth prospects (Maqsood, Muhammad, & Chaudhary, 2016; Saidu & Salisu, 2020; Akinpelu & Ogunbi, 2013; Nyasha & Odhiambo, 2020; Nahar, Adha, & Azizurrhoman, 2018). The gross domestic product, or GDP, is the value of goods and services produced in a country in a given year, expressed per person, whereas the growth rate shows the rate of change in GDP between two consecutive years.

Conceptual Framework



Note. Authors' Design (2023)

This study recognizes two remittance measures from the literature, workers' remittances and personal remittances, and will attempt to track how it influences economic growth, with the presence of control variables, foreign direct investment (FDI), government expenditure, and exchange rate, as used in many of the previous studies reviewed (e.g. Emmanuel & Obiechi, 2013; Akinpelu & Ogunbi, 2013; Ubi & Esien, 2018).

Theoretical Review

There are several growth theories discussed in literature such as the endogenous growth model, Solow growth model, neoclassical growth model, new Keynesian models, real business cycle models, just to mention a few. However, the Harrod-Domar growth model is reverend in this study due to its relevance to this study and its simplicity.

Harrod-Domar Growth Model

This growth model is rooted in the independent studies conducted by Roy F. Harrod in 1939 and Evsey Domar in 1946, which focused on the growth process. These theorists proposed that the key to economic growth lies in the formation of physical capital through savings and investment. They argued that the rate of output growth is directly related to the savings rate divided by the change in the capital-output ratio. As a result, there is a clear relationship between savings and growth. To summarize the production theory, output is determined by the interaction of capital and labor. However, developing countries frequently confront a capital shortage and rely largely on labor-intensive businesses. This scarcity is due to a lack of savings capacity as well as financial marginalization. As a result, a lack of capital becomes a barrier to output growth. In essence, this idea proposes that economic growth can be achieved by channeling savings into capital investment. Nonetheless, it should be highlighted that this study

is based on a closed economy, which means it does not take into consideration international commerce and transactions. Nonetheless, given the recognition of savings and investment as crucial drivers of growth, remittances can serve as a means of supplementing a country's savings capacity through support from emigrants. This, in turn, can enhance investment and ultimately contribute to the country's growth.

Empirical Review

Many research works has been conducted on the relatioship between remittances and economic growth in the past, like Shahedur's (2015) who examined remittances and growth relationship. Remittances, investment, growth rates, human capital, population growth, foreign direct investment (FDI), trade openness, political stability, inflation, and government spending are all factors considered in the study. Pooled regression analysis was used to evaluate panel data taken from 1981 to 2010. İt was found that there is strong and positive association between remittances and growth in lower and upper-middle-income economies. However, it has been argued that the association may differ when other income groups are considered. In Muhammad and Chaudhary (2016), similar examination was conducted in Parkistan using GDPpc, workers' remittances to GDP ratio, export/GDP ratio, domestic investment/GDP ratio, and foreign direct investment/GDP ratio. The study, which was between 1980 and 2010, employed a multivariate regression model in analysing the data. The results showed that worker remittances had a considerable positive effect on GDP. Katsushi, Bilal, and Fabrizio (2017), an Asia study, have a similar evidence was was observed where, on the one hand. Remittances have a favorable impact on growth and on the other hand have a negative implication on poverty. İn another study, with the data between 1980 to 2016, Ubi and Essien (2018) studied the effect of remittances on economic development in Nigeria. The variables employed include remittances, human development index, labor force, domestic savings and FDI. After using the ARDL, co-integration and Granger causality test, it was found that positive and substantial effect occurred on the human development index due to remittance inflows. In addition, considering the relationship between growth and remittance in Indonesia using historical data, GDP growth, remittances, foreign aid, short-term indebtedness, and trade openness with 33 year sample data (1983-2016) (Nahar et al., 2018) were employed. It was found that there is a strong positive effect of remittances on growth.

However, in Anetor (2019), a different result was obtained in Nigeria between 1981 and 2017. The study employed remittances ratio to GDP, financial development (M2) to GDP and trade openness. Others include government expenditure to GDP, population and gross capital formation ratio to GDP. The ARDL model's findings revealed that remittances had a negative implication on Nigeria's economy. Also, Nigeria remittance-growth relationship was examined by Loto and Alao (2019) with data between 1980 and 2016. The variables used include real GDPpc, remittances from migrants and workers, gross fixed capital formation and trade openness. Johansen co-integration and causality approaches were used. The outcome of the study showed that there is a long-run positive and significant association between migrants' remittances and growth, while workers' remittances showed a significant negative relationship. Also, there is a one-way relationship between GDPpc and migrant remittances. In another development, investigated remittances, financial development and economic growth in Sub-Saharan Africa were invstigated (Olayungbo & Quadri (2019)). Hence, private sector-to-GDP ratio, trade openness, inflation rate, broad money-to-GDP ratio, population growth and FDI were factors evaluated. From 2000 to 2015, data from twenty Sub-Saharan African nations were collected and used in the investigation. According to the findings, both financial development and remittances moved in the same positive direction with growth in both short-run and long-run. Furthermore, the study found that financial development has a substitution effect on the

relationship between remittances and economic growth. In addition, the result revealed a unidirectional causal links between GDP and remittances, as well as, between financial development and growth.

Tu et al. (2019) investigated the relationship between financial inclusion, remittance inflows, and economic development using a worldwide panel data analysis. Data between 2004 and 2017 on the financial inclusion index, personal remittances, industrialization, infrastructure, inflation, literacy, government spending, population growth, population density, unemployment, institutional quality and GDP were collected and evaluated. It was revealed that financial inclusion and remittances had a clear positive impact on economic development, particularly in middle-income nations, according to the research.

Furthermore, Witness, James, and Kunofiwa (2019) investigated the link between remittance inflows and financial and economic development in the Communities of Southern African Development. The variables included in the study were remittance inflows, financial development, exports, exchange rate, inflation and GDP growth rate serving as the dependent variable. Data from fourteen countries within the region were collected and analyzed using GMM dynamic panel techniques, covering the period from 2006 to 2016. The results showed two different scenarios. While there is a positive impact of remittance-growth relationship, a negative relationship existed between remittance and financial development.

Nyasha and Odhiambo (2020) investigated the relationship between remittance inflows and economic growth in South Africa. From 1970 to 2017, the study used data on the real GDP growth rate, financial development, the ratio of cross-border remittance inflows to GDP, trade openness, and domestic savings. . An ARDL co-integration and the Granger causality test were used, and the results demonstrated that there is no causal association between remittance inflows and economic growth. Likewise, Saidu and Salisu (2020) investigated the link between overseas remittances and economic growth in Sub-Saharan African countries. From 1980 to 2017, panel data on GDP, remittance, openness, FDI, and domestic investment were used in the study. The panel co-integration model result demonstrated that remittances had a long-run positive impact on economic growth. The impact of remittances on economic growth in low and middle-income countries was explored in a study undertaken by Zakaria and Normaz (2020). Human capital, population growth, remittances, gross fixed capital formation government final consumption expenditure and GDPpc were estimated from data taken from 2009 to 2017. The results revealed a significant negative relationship between remittances and growth. However, when outliers were considered, the data showed that remittances had an inverse relationship but with small impact on economic growth. Again, Manguzvane and Udimal (2022) investigated the impact of remittances on economic growth in South Africa from 1970 to 2019. Personal remittances, gross domestic savings, domestic bank credit to the private sector, total factor productivity, wide money, population, and capital formation were all employed in the study. The ARDL model was used in the study, and the results showed a significant and negative link between remittances and economic growth, both in the short-run and long-run.

İt can be inferred from the literature above that there is no consensus on the growth impact of the remittance inflow. This study however focuses on the Nigerian economy and recent data are employed in examining both the short and the long-run growth impact of remittance inflow.

Methodology

Based on the World Development Index, historical data covering a period of 42 years, from 1980 to 2021 was collected on the GDP growth rate, personal remittance, foreign direct

investment (inflow), exchange rate (Naira per Dollar) and government expenditure in this study. In other to examine the short-run and long-run effects of remittance inflows on economic growth, Johansen Cointegration techniques was employed as the econometric tool of data analysis based on the result of unit root test.

Model Specification

This study builds upon the econometric model of Emmanuel and Obiechina (2013) but introduces modifications to better suit the objectives of this study. In contrast to the original model, this study used the gross domestic product growth rate as the dependent variable and excludes exports from the list of explanatory variables. Additionally, the model for this study incorporates personal remittances and government expenditure as additional predictors. The model for this study is thus specified as:

$$\ln GDPgr_t = b_0 + b_1 \ln PREM_t + b_1 \ln FDI_t + b_1 \ln EXR_t + b_1 \ln GEXP_t + e \quad (1)$$

Where used in the equation, GDPgr is the gross domestic product growth rate, PREM is the personal remittance, FDI is the Foreign Direct Investment, EXR is the Exchange rate, GEXP is the government expenditure, and e is the random error term.

Discussion of Results

Table 1

Correlation Matrix

	GDPgr	PREM	FDI	EXR	GEXP
GDPgr	1.000				
PREM	0.191	1.000			
FDI	0.056	-0.293	1.000		
EXR	0.154	0.391	-0.332	1.000	
GEXP	0.066	0.326	-0.368	0.361	1.000

Note. Authors' Computation, (2023)

The findings presented in Table 1 demonstrate positive correlations between the explanatory variables and the GDP growth rate in the study. Specifically, the reported correlation coefficients for GDP growth rate and remittances (PREM), GDP growth rate and foreign direct investment (FDI), GDP growth rate and exchange rate (EXR), and GDP growth rate and government expenditure (GEXP) were determined to be 0.1913, 0.056, 0.15404, and 0.06644, respectively. The correlation values for pairs of the explanatory variables were observed to be -0.2931 for remittances and foreign direct investment, 0.39056 for remittances and exchange rate, 0.326168 for remittances and government expenditure, -0.33209 for foreign direct investment and exchange rate, and -0.367517 for foreign direct investment and government expenditure. These results indicate a moderate level of correlation among the explanatory variables, suggesting a low likelihood of significant multicollinearity within the model being estimated

Table 2

Unit Root Test Result

Variables	level	First diff.	1% c.v	5% c.v	Remark
GDPgr	-1.641	-12.404	-2.626	-1.950	I(1)
PREM	-1.648	-6.369	-4.212	-3.530	I(1)
FDI	-2.711	-10.647	-3.610	-2.939	I(1)
EXR	-1.466	-5.683	-4.212	-3.530	I(1)
GEXP	-0.403	-7.970	-4.212	-3.530	I(1)

Note. Authors' Computation, (2023)

The result presented in Table 2 indicates that none of the variables was stationary at their original levels. However, after applying the first differencing, all variables became stationary. In summary, the results revealed that GDP growth rates, personal remittances, foreign direct investment, the exchange rate, and government expenditure are integrated at the order of one I(1). Based on the result of the unit root test obtained, the best estimation technique suggested by Gugarati and Sangeetta (2007) is the Johansen cointegration technique. Therefore, the study employed Johansen cointegration technique to examine the long-run and short run effect of remittance inflow on the economic growth of Nigeria .

Table 3

Co-integration test summary

Rank	Trace stat.	5% c.v	Max-Eigen stat.	5% c.v
r = 0	81.078***	69.819	34.673**	33.877
r = 1	46.405*	47.856	22.302	27.584
r = 2	24.104	29.797	12.725	21.132
r = 3	11.379	15.495	9.338	14.265
r = 4	2.041	3.841	2.041	3.841

**** p < 0.01; ** p < 0.05; * p < 0.1*

Note. Authors' Computation

The analysis conducted in this section, as presented in Table 3 demonstrated conclusive evidence to reject the null hypothesis of no co-integration equation in favour of the existence of a single co-integration equation, as indicated by both the trace and maximum eigenvalue test statistics. This signifies that although there may be no immediate equilibrium relationship between the variables in the short term due to their different levels of integration, there is indeed a long-term equilibrium relationship among them. Importantly, the long-run estimation findings, as depicted in Table 4, further support the presence of this co-integration relationship among the variables.

Table 4

Long-run estimates

Variable	Coef.	Std. err.	t-Stat.
PREM	1.974	0.621	3.179***
FDI	-4.744	0.770	-6.161***
EXR	2.458	1.349	1.822
GEXP	-4.919	1.737	-2.832**

**** p < 0.01; ** p < 0.05; * p < 0.1*

Note. Authors' Computation

The result presented in Table 4 indicates that, in the long run, there is a positive significant impact of inflow of personal remittances on the GDP growth rate. Specifically, the coefficient for personal remittances is 1.9738, with a standard error that is less than half of the reported coefficient. This implies that holding other factors constant, a one percentage point increase in the inflow of personal remittances is associated with approximately a 1.973% increase in the rate of GDP growth in Nigeria. The coefficient estimates for the others variables are as follows: -4.744 for FDI, 2.4581 for the exchange rate, and -4.9191 for government expenditure. Therefore, remittance inflow has significant long run effect on Nigeria economic growth.

Table 5

Short-run estimates

Variables	Coef.	Std. err.	t-Stat.	Prob.
Constant	0.070	0.284	0.246	0.808
D(GDPGR(-1))	-0.425	0.157	-2.703	0.011**
D(PREM)	-0.338	0.309	-1.095	0.282
D(FDI)	0.455	0.307	1.482	0.149
D(EXR)	-2.285	0.639	-3.578	0.001***
D(EXR(-1))	1.613	0.656	2.458	0.020**
D(GEXP)	1.752	1.051	1.668	0.106
D(GEXP(-1))	-0.987	0.893	-1.105	0.278
Ect(-1)	-0.498	0.245	-2.033	0.049**
R2-adj. = 0.620, D.W. = 2.043, RESET = 1.438, JB = 0.618				
$\chi 2$ (LM) = 0.036, White = 0.869.				

**** p < 0.01; ** p < 0.05; * p < 0.1*

Note. Authors' Computation

The influence of personal remittances on the short-term GDP growth rate is not statistically significant, as indicated by the reported coefficient of -0.337970 ($p = 0.2822 > 0.05$), according to the succinct error correction model estimation findings presented in Table 5. This means that, if all other variables remain constant, a one percent increase in remittance inflows results in a 0.34% decline in the pace of GDP growth in the short run. Therefore, remittance inflow does not significant influence economic growth of Nigeria in the short run.

The error correction term coefficient, -0.4979, implies that around 49.8% of short-run inconsistencies are *corrected* annually and incorporated into the long-run dynamics. Furthermore, according to the reported R-square, remittance inflows, foreign direct investment, the exchange rate, and government spending account for 69.98% of the systematic fluctuations in GDP growth. The post-estimation diagnostic test findings were reported in the final section of Table 5. The RESET test results demonstrated that the model is appropriately presented. Furthermore, the Jarque-Bera statistic suggests that there is insufficient evidence to reject the null hypothesis that the error component follows a normal distribution. Furthermore, the Breusch-Godfrey serial correlation LM test indicates that there is no indication of serial correlation in the estimated models' error terms. Furthermore, the F-statistic for heteroscedasticity is small, indicating that there is no evidence to reject the null hypothesis of error term constant variance.

Discussion

The current findings stipulate and confirm that remittance still plays significant roles in economic development. It is affirmed that remittance inflows and economic growth move in positive direction but only significant in the long run, while the impact is not significant in the short-run. Importantly, the study emphasizes that changes in remittance inflows in Nigeria might result in a large boost in the country's GDP growth rate in the long run. It can be deduced that the remittance inflows in Nigeria are put into productive activities that have long term yield. It shows that beneficiaries or recipients are not focus on economic activities that have short term yield. However, there has been a growing recognition of the need of channeling these inflows into productive or investment routes, which eventually leads to a significant positive influence in the long run. These findings are consistent with those of prior studies, such as Saidu and Salisu (2020), which found that remittances had a favorable long-run influence on economic growth. Furthermore, the findings of this study are congruent with those of Nahar, Adha, and Azizurrohman (2018), Katsushi, Bilal, and Fabrizio (2017), Wiseman, James, and Kunofiwa (2019), and other researchers in the field.

Conclusion

According to this study, the influx of personal remittances may have a major positive influence on Nigeria's economic growth in the long run. However, persistent increases in remittance inflows have the potential to greatly boost economic growth in Nigeria when such is put into productive economic activities. As a result, the study suggests that policies, initiatives, and system improvements be implemented to encourage the beneficial use of remittances. Furthermore, it emphasizes the significance of building procedures to manage brain drain, ensuring that precious human capital is not lost only for the sake of money inflows that may not be channeled equitably into productive activities in the short and medium term.

References

Anetor, Friday Osemenshan (2019). Remittance and economic growth nexus in Nigeria: Does financial sector development play a critical role? *International Journal of Management, Economics and Social Sciences, 8*(2), 116-135

Biyase, M., Manguzvane, M. & Udimal, T. (2022). *Remittances and economic growth in South Africa: applying ARDL bounds testing analysis in the presence of structural breaks*. EDWRG Working Paper Series

Chami, R., Barajas, A., Cosimano, T., Fullenkamp, C., Gapen, M. & Montie, P. (2008). *Macroeconomic consequences of remittance*. Washington, DC, International Monetary Fund

Emmanuel, U.U. & Obiechina, M.E. (2013). Workers' remittances – economic growth nexus: evidence from Nigeria, using an error correction methodology. *International Journal of Humanities and Social Science, 3*(7), 212-227

Gujarati, D.N. & Sangeetha (2007). *Basic Econometrics*, New Delhi, Tata McGraw-Hill publishing company 4th Edition

Iheke, O.R. (2012). The effect of remittances on the Nigerian economy. *International Journal of Development and Sustainability, 1*(2), 614–621

Jhingan, M. L (2007). *The Economics of Development and Planning*. 39th Edition. Delhi, Vrinda publication Ltd.

Kindleberger, C. P. (1965). *Europe's Postwar Growth*: The Role of Labor Supply. New York: Oxford University Press.

Larsson, P. &Angman, J. (2014). *Remittances and development: Empirical evidence from 99 developing countries.* Retrieved from the Department of Economics database, Uppsala University

Loto, M.A. and Alao, A.A. (2019). Remittances and the growth of the Nigerian economy. *Eurasian Journal of Business and Economics, 6*(2), 209-232

Maqsood, A., Muhammad, I. & Chaudhary, A.R. (2016). The impact of workers' remittances on economic development of Pakistan. *Arabian Journal of Business and Management Review, 6*(5), 48-54

Muritala, T.. & Taiwo, A. (2011). *Government expenditure and economic development: empirical evidence from Nigeria,* MPRA Paper 37293, University Library of Munich, Germany.

Nahar, F.H., Adha, M.A. & Azizurrohman (2018). Effects of remittances on economic growth in Indonesia. *9th International Conference on Socio-economic and environmental issues in development*, National Economics University, Hanoi, Vietnam

Nyasha, S. & Odhiambo, N.M. (2020). Does remittance inflow granger-cause economic growth in South Africa? A dynamic multivariate causality test. *The Review of Black Political Economy, 47*(1), 86-103

Okpe, I. I. (2013). Money market on the Nigerian economic development, *Journal of Economic and Sustainable Development*, 4(5), 5-11

Olayungbo, D.O. and Quadri, A. (2019). Remittances, financial development and economic growth in sub-Saharan African countries: evidence from a PMG-ARDL approach. *Financial Innovation, 5*(9), 1-25

Saidu, I. & Salisu, A. (2020). International remittances and economic growth in some selected sub-Saharan African countries: evidence from panel co-integration approach. *Journal of Economics and Development Studies, 8*(2), 63-71

Stanley, R. L, & Buckley. R. P. (2016). Protecting the West, excluding the rest: the impact of the AML/CTF regime on financial inclusion in the Pacific, and potential responses. Melbourne *Journal of International Law* 17(1).

Tewolde, R. (2005). Remittances as a tool for development and reconstruction in Eritrea: An economic analysis. *Journal of Middle Eastern Geopolitics*, 1(2): 1-12.

Tu, C.A., Phi, N.T., Tuan, L.Q., Yoshino, N., Sarker, T. & Taghizadeh-Hesary, F. (2019). *Remittance inflows, financial inclusion and economic development: an empirical analysis of the world sample*. ADBI Working Paper Series.

Ubi, P. & Essien, M. (2018). Remittances and economic development in Nigeria: a macroeconomic approach. *International Journal of Economics, Commerce and Management, 6*(6), 26-46

Witness, N.B., James, Z. & Kunofiwa, T. (2019). Remittances, financial development and economic growth: a case of southern African development community. *Acta Universitatis Danubius Oeconomica, 15*(4), 67-82

Zakaria, L. and Normaz, W.I. (2020). The Impact of Remittance on Economic Growth in low and Middle Income Countries. International *Journal of Academic Research Economics and Management Sciences*, 9(2), 62-70.

Information About the Article/Makale Hakkında Bilgiler

The Ethical Rules for Research and Publication / Araştırma ve Yayın Etiği

The authors declared that the ethical rules for research and publication followed while preparing the article.

Yazarlar makale hazırlanırken araştırma ve yayın etiğine uyulduğunu beyan etmiştir.

Conflict of Interests/ Çıkar Çatışması

The authors have no conflict of interest to declare.

Yazarlar çıkar çatışması bildirmemiştir.

Grant Support/ Finansal Destek

The authors declared that this study has received no financial support.

Yazarlar bu çalışma için finansal destek almadığını beyan etmiştir.

Author Contributions/ Yazar Katkıları

The draft process of the manuscript/ Taslağın Hazırlanma Süreci T.O./O.B.O., Data Collection/Verilerin Toplanması T.O./O.B.O., Writing The Manuscript/ Makalenin Yazılması T.O./O.B.O., Submit, Revision and Resubmit Process/ Başvuru, Düzeltme ve Yeniden Başvuru Süreci T.O./O.B.O.