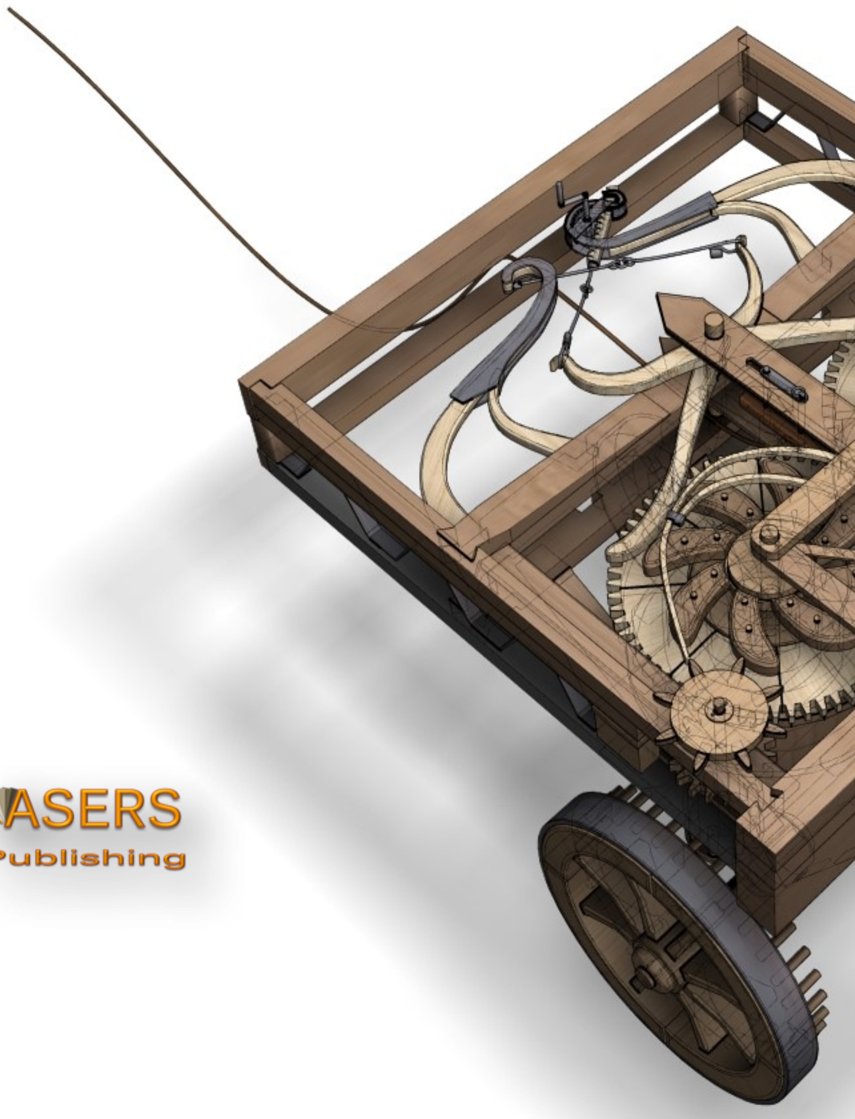
# Theoretical and Practical Research in Economic Fields



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# Volume XV, Issue 2(30), Summer 2024
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# Implementation of the Provisions of the Cluster Theory into the Accounting System: Genesis and Evolution

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**Abstract:** *In current economic conditions, a large number of enterprises carry out their activities by joining into network (cluster) structures, which is one of the means of improving competitive relations in the external environment. To ensure the integration of the interests of participants in network structures by increasing the coordination and controllability of interactions, a significant place is given to the accounting system as the main source of information. The article aims to study the theoretical and methodological foundations of implementing the cluster economy concept in the accounting system. The methodological basis is the fundamental provisions of modern economic institutional theory and scientific works of scientists. As a result of the research, it was possible to analyze the historical aspects of the development of accounting support for managing cluster structures. The areas of development of accounting based on the provisions of economic theory and taking into account the specific features of cluster structures are identified and substantiated.*

**Keywords:** cluster; network; economic theory; institutional theory; accounting.

**JEL Classification:** O17; P30; M41.

## Introduction

In connection with the global financial crisis, the consequences of the COVID-19 pandemic and military actions in Ukraine in recent years, the issues of restoring and increasing the competitiveness of the national economy have become important. Taking into account the strengthening of the processes of globalization and competition in the world economy, objective prerequisites for Ukraine arose and the need to change the paradigm of competitiveness management, which consists of the rejection of traditional industrial policy and the transition to cluster policy. The cluster model of economic development is considered by many scientists as a tool for sustainable development and increased competitiveness due to the synergistic effect, the basis of which is the quality and optimal combination of elements included in the system, and the effectiveness of their interaction.

The purpose of the article is to study the issues of implementing the provisions of the cluster theory into the accounting system. The structure of the work is as follows: Chapter 2 discusses the theoretical foundations of this study. The methodology of the research is given in Chapter 3. The identified and worked-out results are described in Chapter 4. In Chapter 5 there is a discussion of the main results of the work.

## 1. Theoretical Background

### 1.1. Emergence and Approaches to the Classification of Cluster Economic Theory

To study the theoretical and methodological foundations, it is advisable to consider the main theories that became the basis of the formation of the cluster model of the national economy. The concept of national, state and local competitiveness in the context of the world economy, in which economic clusters play a key role in creating competitive advantages, was most fully and clearly described by Prof. Harvard Business School M. Porter. He owns the basic definition of a cluster as a group of geographically adjacent, interconnected companies (suppliers, manufacturers, etc.) and related organizations (educational institutions, public administration bodies, infrastructure companies) operating in defined areas and complementing each other (Porter 1998). The American scientist M. Enright, who notes in his research that competitive advantages are created at the regional level, and not at the supranational or national level, concludes that regional clusters exist, which is an industrial clusters in which participating firms are in close relationship connection (Enright 2003).

After the theoretical justification by M. Porter and M. Enright, the cluster model of economic development became widespread and is used in civilized countries of the world as an effective tool for increasing competitiveness. “Being essentially a meta-theory, that is, a theory of a higher order, the cluster theory initially had an extremely eclectic, fragmentary, mosaic character” (Sheikin 2016). However, it is worth noting that in recent decades the theory of clusters has undergone certain metamorphoses under the influence of economic theories. Thus, Karapetyan and Kvasovskyi (2014), studying cluster theories in chronological order, indicate that “the modern concept of clusters has absorbed the achievements of numerous theoretical approaches, simultaneously acting as an “umbrella” model that creates a coordinate system and a common basis for many more specialized scientific studies”. Pankova (2019) conducted fundamental studies of the evolution of the theory of clusters in the directions of economic thought, and identified the following four stages: 1. The stage of formation of the fundamental theoretical and methodological foundations of the theory of clusters (XIX century – beginning of the XX century); 2. The stage of systematic development and specialization of scientific theories and concepts in the context of the formation of the theory of clusters (50-80s of XX century); 3. The stage of formation of the basic principles of the theory and concept of cluster development (80-90s of XX century); 4. The stage of cross-paradigm synthesis of modern features of cluster theory (the 90s of the XX century – the beginning of the XXI century).

The scientific literature (Kyzym 2011) singles out five main classical scientific schools that made the greatest contribution to the theory of spatial economy and are the basis of the cluster approach in the industrial policy of the countries of the world, namely:

– the German School of production placement (Tunen I., Laungardt V., Weber A., Kristaller V., Lösch A.);

– theory of English industrial districts (Marshall A.) and Italian industrial districts (Becattini J.);

– the French school of poles of growth and competitiveness (Perroux F., Boudville J., Pothier P., Aglietta M., Boyer R.);

– the American “centre-periphery” model (Friedman J.);

– Soviet School of territorial and production complexes (Aleksandrov I., Kolosovsky M., Bandman M., Saushkin Yu., Palamarchuk M., Baranovsky M.).

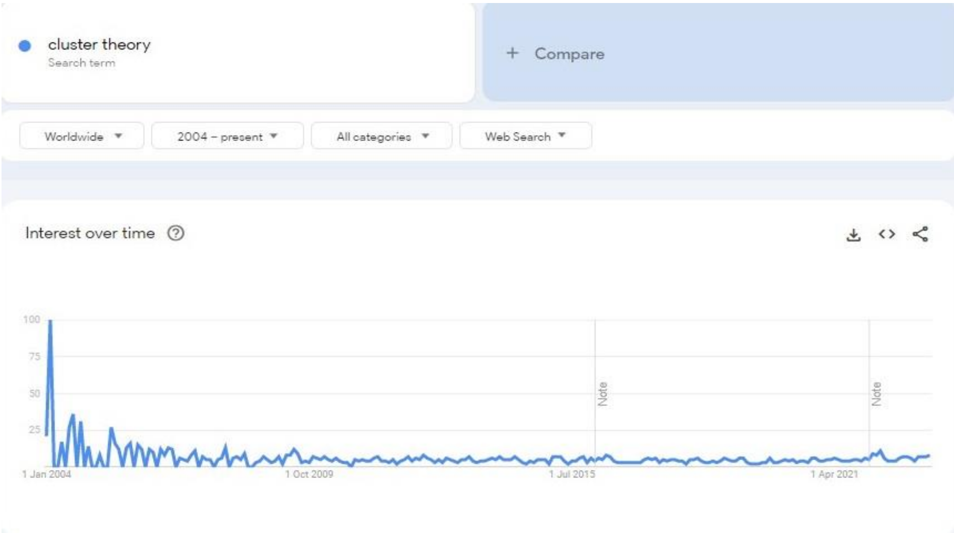
A slightly different opinion is held by Karpenko *et al.* (2021) noting that the following theories are the most important: regional specialization (Smith A., Ricardo D., etc.); location of production (Tunen J., Launhardt V., Weber A., Loesch A., etc.); industrial districts (Marshall A.); cumulative growth (Perru F., Boudville J.-R., Potier P., Myrdal G., etc.); innovative (Schumpeter Y.); economic zoning and territorial production complexes (Kolosovsky M.); industrial districts (Bocattini J.); network (White H., Granovetter M. and others).

Rybak (2012) presented a classification of cluster theories, which allowed the author to distinguish the main scientific schools and historical stages in their development: the 1st stage, the French-Italian school (Perrou F., Tolenado I., Saulier D., May D., Becattini J.); 2nd stage, American and British schools (Marcusen E., Porter M., Enright M., Rosenfeld S., Maskell P., Hart D., Delgado M.), 3rd stage, European and Scandinavian schools (Solvel O., Ketelz K., Petrin T.).

The current stage of cluster theory formation (which began after 2000 years) was associated with the growth of globalization and the transition to an innovative model of economic development. This has led to the emergence of a number of studies on the role of clusters in the process of economic growth by creating an environment conducive to the creation and commercialization of innovations (Vysochan *et al.* 2021; Vysochan *et al.* 2022b; Kyriazis and Metaxas, 2023; Kulyniak *et al.* 2022).

To track the dynamics of the popularity of the term "cluster theory" (cluster theory), a public web application of the Google Corporation – the Google Trends tool – was used. The results of the analysis are shown in Figure 1.

Figure 1. Search results in Google Trends by keyword cluster theory for 2004-2023




*Source:* generated by the authors using Google Trends (https://trends.google.com/trends/explore?date=all&q=cluster%20theory&hl=en-GB)

As can be seen from Figure 1 volume for this search query in this topic is quite unstable, and the biggest peak fell in the late 90s – early 2000s, which is associated with the rapid development of this concept. Since 2010, the trend has started to decline and the popularity of using the term has decreased somewhat, but in the last few years, this trend has changed radically, indicating that this topic remains relevant in the future.

### 1.2. The Practice of Introducing the Concept of Cluster Economy in Ukraine

Analyzing the domestic experience of applying the cluster approach, it should be noted that starting from 2003, the Cabinet of Ministers of Ukraine adopted several normative legal acts, which deal with the expediency of clustering the economy of the country and its regions. In particular, the draft order of the Cabinet of Ministers of Ukraine "On approval of the concept of creating clusters in Ukraine" (2008) was presented, in which regional production clusters were considered as a basis for increasing the competitiveness of the national economy. The need to accelerate cluster development is outlined in the Project of the national cluster development program until 2027. In several other Resolutions of the Cabinet of Ministers of Ukraine, which related to the state development of industry, the strategy of regional development and the economic target program, the creation of innovation clusters was also provided for. However, such efforts remained unsystematic, and as a result, the implementation of the cluster approach in Ukraine became fruitless (Hyk *et al.* 2022a). Despite this, there are attempts to independently identify and structure clusters in some regions of the country.

In recent years, an active transition to the introduction of cluster policy and the formation of a modern competitive economy has been observed in Ukraine. Several indicators reflecting economic, political and social factors are used to assess the level of competitiveness of a country's economy (Hyk *et al.* 2022b). To establish the place and role of the country in the global economic space, and to establish the competitiveness of the national economy in the world, several ratings have been developed. The results of monitoring the positioning of Ukraine in the ranking among the countries of the world in the period 2020-2022 by separate indices are shown in the table 1.

Table 1. Place of Ukraine among the countries of the world according to individual indices in the context of the cluster model of economic development

| Index name | Index value (place) | | |
|---|---|---|---|
| | 2020 year | 2021 year | 2022 year |
| The Global Sustainable Competitiveness Index | 46.7 (76/180) | 45.8 (79/180) | 46.9 (49/180) |
| Network Readiness Index | 49.43 (76/134) | 55.70 (53/130) | 55.71 (50/131) |
| Global Innovation Index | 36.32 (45/132) | 35.6 (49/132) | 31.0 (57/132) |
| Transitions performance index. Towards fair and prosperous sustainability | 48.50 (64/72) | 48.51 (64/72) | There is no information |

*Source:* generated by the authors based on [*https://solability.com/the-global-sustainable-competitiveness-index/downloads; **https://networkreadinessindex.org/; ***https://www.wipo.int/global_innovation_index/en/; ****https://op.europa.eu/en/publication-detail/-/publication/50fff167-a34e-11ec-83e1-01aa75ed71a1/language-en].

From the data in the table 1 shows that although the value of the Global Sustainable Competitiveness Index of Ukraine has practically not changed, in 2022 it has risen in the rating by 17 positions. Positive dynamics are also observed according to the Network Readiness Index, which characterizes the level of development of information and communication technologies and the network economy in the countries of the world. According to this comprehensive indicator, Ukraine rose both in absolute terms and in terms of position (26 steps higher than in 2020).

In the Global Innovation Index Report in 2022, Ukraine took 57th place among 132 countries in the world and worsened its position compared to previous years (Hyk, 2021). The dynamics of indicators according to the Global Innovation Index allow us to conclude the lack of active support of innovation policy by the state.

According to the Transitions performance index. Towards fair and prosperous sustainability, which measures the effectiveness of countries at four stages of transition: economic, social, environmental and managerial, Ukraine remains in an unchanged position.

In general, according to the above indices, Ukraine managed to maintain its position or improve in some ratings, but these fluctuations were insignificant. Among the main problems and challenges facing Ukraine are the large-scale invasion of Russia and overcoming the consequences of the COVID-19 pandemic. In such conditions, one of the drivers of growth and countering crisis phenomena is the implementation of the cluster model of economic development.

## 2. Research Method

The research was carried out based on a systematic approach to the knowledge of the theoretical and methodological foundations of the cluster model of the development of accounting with the use of general scientific and special principles and methods (scientific abstraction – to understand problematic issues and in-depth study of the implementation of the cluster model of the economy in the accounting system, comparative analysis – to identify attributes and main directions, generalization – for systematization of approaches, specification – for characterizing the theoretical toolkit, meaningfulness and formation of the author's proposals for the development of accounting, graphic – for the non-textual display of research results).

## 3. Result

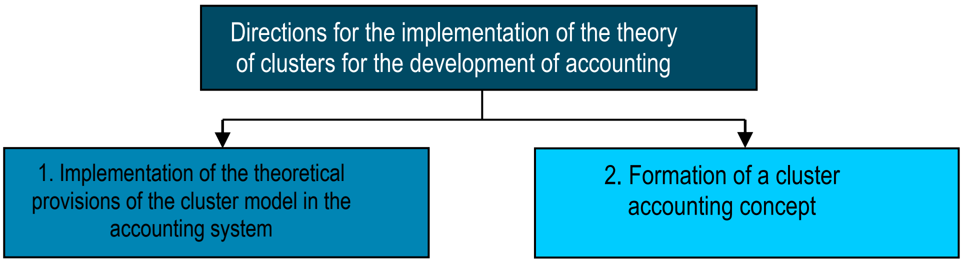
The processes of formation of cluster formations in the economy of Ukraine are caused by the integration of the interests of branch structures and subjects of regional socio-economic development. Cluster associations have great potential for diversification of production and cooperation, and the introduction of innovative products to the market. For the effective implementation of the cluster policy, an important place is given to the accounting system as a source of information for making management decisions. Accounting must reflect the economic processes taking place in the conditions of clustering of the economy of Ukraine.

The following foreign scientists paid attention to the problems of accounting provision of inter-organizational management of cluster structures in their works: Anderson S., Berry A., Broadbent J., Varoutsa E., Ditillo A., Dekker G., Kallio A., Karlsson-Wall M., Kraus K., Kulmal H.I., Lind J., Mahama H., Mouritsen J., Otley D., Revellino S., Scapens W., Tomkins K., Train S., Chapman C.S., Chua W. F., Hakansson H., Hopwood A. G. and other.

In Ukraine, this issue was considered in their works by Vysochan O. S., Gogol M. M., Zhiglei I. V., Zhuk V. M., Kireytsev H. G., Levina M. V., Legenchuk S. F., Pylypenko A. A., Sadovska I. B., Semenyshena N. V., Slozko T. M., Struk N. S., Yukhymenko-Nazaruk I. A. and others. However, despite the considerable interest and relevance of this issue, it is worth noting that there are currently no comprehensive studies and a clear mechanism for practical implementation. Therefore, there is an objective need to study the possibilities and directions of implementation of the concept of economic clustering through the accounting system.

Based on the results of researching the scientific literature, it is possible to single out the following areas of implementation of the theory of clusters for the development of accounting (Figure 2).

Figure 2. Directions for the implementation of the theory of clusters for the development of accounting




*Source:* generated by the authors

**1. Implementation of the theoretical provisions of the cluster model in the accounting system.**

Accounting is closely related to various classical sciences and theories. As Bondar (2010) noted at one time, "... the science of accounting must function in a close relationship with other economic theories and teachings".

Inclusion in the accounting theory of the provisions of the cluster model of economic development must be carried out taking into account its specific features:

*a) geographical concentration and proximity of associations of enterprises that carry out joint financial and economic activities.*

A significant contribution to the foundation of the theory of clusters was the research of Marshall (1920), published in the book "Principles of economics". He claimed that groups of small and medium-sized enterprises, provided they are geographically located in one "industrial district", will be more efficient and lead to better economic development.

The foundation of the theory of the new economic geography was laid by the Nobel laureate in Economics Krugman (1991) in the work "Increasing returns and economic geography". The basis of this theory is the concept of regional development "core-periphery", according to the provisions of which network interactions between individual individuals and firms accelerate the introduction of innovations and lead to the development of a colossal economic agglomeration. Further development of the provisions of the concept found its continuation in the theory of Ellison and Glaeser (1999) about the "natural advantages" of geographical concentration. The combination of geographic and organizational concentration as a tool for increasing joint activity in the cluster is substantiated in the theory of economic proximity by Torre (2006). He modelled the so-called "ideal cluster", the key characteristic of which is the presence of geographical and organizational proximity of the participants.

An overview of the theory of agglomeration and clusters in different spatial contexts is thoroughly described in the work Handbook of Research on Cluster Theory under the scientific supervision of Karlsson (2008).

Enterprises united in a cluster receive competitive advantages from joint activities while maintaining their autonomy. The OECD Principles of Corporate Governance (2015) can be considered the theoretical basis for the formation of a cluster association of enterprises. The paradigmatic attitudes of these principles regarding the formation of the theory of clusters are that the corporate governance system should take into account not only the interests of the cluster itself but also the interests of other counterparties of the corporation.

The association of enterprises in clusters form a characteristic economic space with the purpose of exchange of accounting information, free movement of capital and human resources and performing the functions of structural elements of the global system. Separate issues of corporate accounting in clusters were reflected in the work of Pylypenko (2012), who substantiated the approach to reflexive management of cluster development, focusing on the use of consolidated accounting information of cluster participants, and Sadchenko and Gogol (2010) proposed approaches to improving management accounting in conditions of vertical integration and clustering of business.

*b) the social nature of the network form of interaction and partnership relations between cluster participants.*

Networks take the form of a variety of dyadic and more complex relationships and encompass several different inter-organizational relationships, such as joint ventures, strategic alliances, research consortia, and clusters. The network form of business organization is described in the theory of information society by sociologist Castells (2010). Cluster-type network structures can efficiently process information, implement innovations and generate new knowledge. Gordon and MacCann (2000) proposed a "social network" model, according to which clusters are represented by stable local networks, in which interaction within the established institutional environment is carried out based on interpersonal and trusting relationships.

Many scientists (Etzkowitz, 2002; Voynarenko, 2008; Ulyanchenko, 2010; Gordon and MacCann, 2000; Sokolenko, 2004; Castells, 2010; Issabekov *et al.* 2022) think that the synergistic effect of clusters is realized thanks to the interaction of three leading institutional components – science (universities), business and authorities (Figure 3).

Figure 3. The social model of the triple spiral according to Etzkowitz (2002)


*Source*: Etzkowitz (2002)

Later, this cooperation mechanism was described by sociologists as a triple helix model ("Triple Helix Model"), which consists in the fact that the areas of the functional sphere of the intersection of three sectors become a universal institutional matrix and ensure the dynamic development of the cluster.

Interpersonal relationships are also described in the cluster model according to Storper and Venables (2003). Face-to-face contacts help to communicate more effectively, solve problems of stimulation, activation of socialization and training. In the clusters, a process occurs, which they denoted by the term "buzz".

A significant contribution to modern cluster theory was made by García-Villaverde *et al.* (2018), proposing a cross-organizational approach to contextualizing and understanding the relationship between structural social capital and knowledge acquisition. The authors analyze how firms can gain valuable knowledge from their networks inside and outside clusters.

Cluster studies by Ukrainian scientists were primarily carried out in the context of regional development and business management and network cooperation. Thus, the basic conditions for the formation and vital activity of clusters are defined by Voynarenko (2008) in the "5I" concept, according to which the main factors for the functioning of clusters are defined as initiative, innovation, information, integration and interest. Ulyanchenko (2010) proposed the concept of clusters, which is built on the creation of conditions for the sustainable development of regions and the coordination of interests of all its participants.

Accounting should be a component of the cluster management system, the essence of which is the coordination and optimal distribution of information between its participants. The theoretical and methodological foundations of accounting for network interactions and the concept of network accounting are described in the work of Yukhymenko-Nazaruk (2017).

Therefore, the use of the provisions of the cluster economy in accounting forms and activates the mechanism of coordination and coordination of the interests of regional business, science and the state, which is the basis of the successful development of regions due to the achievement of a significant multiplier, synergistic effect and the solution of significant socio-economic tasks.

*c) availability of scientific infrastructure and innovative orientation.*

The theory of economic development based on the formation of innovation clusters was developed by economists Audretsch and Feldman (2004). Combining into innovation clusters leads to the generation and transfer of new knowledge between firms and industries. Hamdouch (2007) emphasizes the inter-organizational and interpersonal relations between the participants of the innovation cluster, which help to achieve different types of innovations in a certain field.

The cluster model of development as a factor of increasing competitiveness is a characteristic feature of the modern innovative economy. In recent years, due to the growing role and importance of innovations, the term "innovation cluster" has been singled out in the economic literature. In particular, according to the definition of the Community Framework for State Aid for Research and Development and Innovation EU (2006), "an innovation cluster is a group of independent enterprises – innovative start-ups, small, medium and large enterprises, as well as research organizations that operate in a certain industry and region and are intended to stimulate innovative activity through intensive interaction, joint use of capacities and exchange of knowledge and competences, ensuring contribution to the transfer of technologies, creation of networks and dissemination of information between cluster subjects".

The relationship between the cluster theory and the modern teachings of innovative development was described in the concept of "blocks of development" by Dahmen (1988), which can be considered a prototype of modern innovative clusters; Lundvall (2010) theories of the "learning economy" and the national innovation system; theories of the regional innovation system Asheim and Isaksen (1996); models of cluster competitiveness "buzz-and-pipeline" Bathelt *et al.* (2004) on mutual exchange of information in the local environment and establishment of global channels of knowledge between cluster participants; theories of Sölvell (2008) about the relationship between the cluster and social factors (employment, labour productivity); the "multi-cluster" theory of Simmie and Sennett (1999) about the internal characteristics of firms and the capabilities of a large agglomeration, which are critical for successful innovation in a region.

Today, cluster structures are one of the most effective forms of organizing innovation and investment processes. The formation and display of information about innovative activity in the cluster should take place in the accounting system (Vysochan *et al.* 2022a; Hyk *et al.* 2021; Lehenchuk *et al.* 2020). We agree with the opinion of the authors Mehovych and Demydenko (2018) "Accounting functions must be aligned with the goals of the system management of innovative activities in the cluster and cover all the various spheres of activity of the cluster member enterprises".

*d) reduction of costs associated with the organization of the entrepreneurial process.*

The formation of a cluster reduces the transaction costs of its participants. The founder of the theory of transaction costs is the Nobel laureate in economics Coase (1988), who in the work "The Nature of the Firm" formulated the existence of transaction costs, the reduction of which is influenced by the presence of an organization and vertical integration. Reduction of transaction costs is possible due to the joint use of information and application of standard contracts. By combining enterprises into clusters, it is possible to reduce the costs of searching for information, searching for partners and concluding contracts, protecting property rights, and opportunistic behaviour.

The use of the provisions of the theory of transaction costs has left its "imprint" on the accounting system. Thus, Levina (2015) analyzed the current state of the clustering of hotel enterprises and proposed a methodology for forming an accounting policy regarding the transaction costs of a hotel cluster. The improvement of the mechanism of strategic management cost accounting of enterprises in the conditions of economic clustering in Ukraine is presented in the work of Glasov (2020).

Thus, it can be stated that the formation of the cluster theory of accounting took place under the influence of classical economic theories. The theory of clusters emerged at the intersection of research on spatial (including regional) economics on the one hand, and innovation economics on the other. The cluster approach in economics represents a synthesis of several directions, including local industrial specialization, spatial economic agglomeration and regional development, institutional theory and the position of strategic management (Vysochan *et al.* 2021). That is, having a generalizing character, the cluster theory of accounting organically "absorbed" various elements of alternative concepts.

**2. Formation of a cluster concept of accounting.**

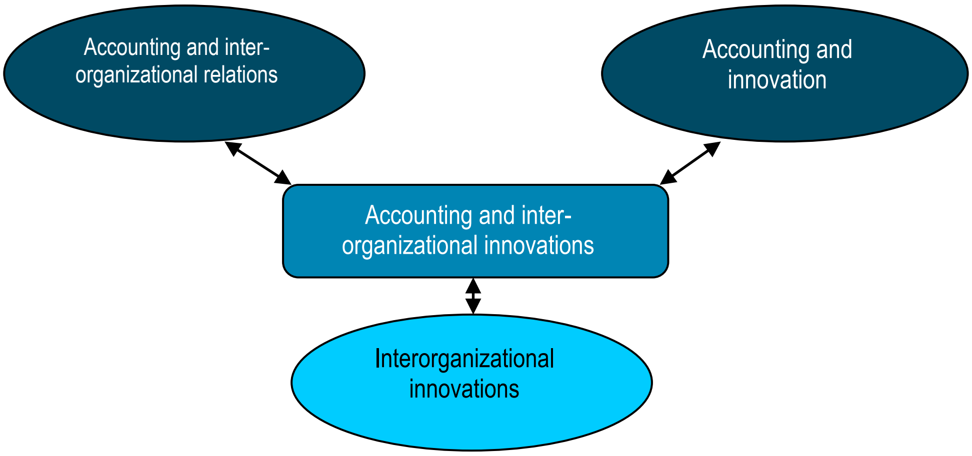
In recent years, organizations have shown increased interest in the collaboration that crosses company boundaries through the creation of new organizational forms, such as strategic alliances, partnerships, joint ventures, outsourcing and networks, and clusters. This event posed new challenges to accounting and prompted scientists to study this issue and expand the scope of research.

In the mid-1990s, several accounting scholars emphasized the importance of expanding the field of accounting beyond the traditional boundaries of the firm. Two important contributions were by Hopwood (1996) and Otley *et al.* (1995). Hopwood (1996) emphasized that historically accounting was concerned with managing vertical relationships within firms and its key functions were to create firm boundaries and reinforce organizational hierarchies. This historical picture of accounting's vertical focus contrasts with contemporary and often contradictory changes in organizational arrangements between firms, such as outsourcing, which emphasize horizontal relationships between legally independent firms rather than vertical activities within firms Otley *et al.* (1995).

In the future, the formation of the cluster concept of accounting was studied in the following works: Chapman (1998) on the involvement of accounting in the coordination of network activities; Tomkins (2001) on the interaction between trust and accounting information in the context of inter-organizational relations; Håkansson and Lind (2004) on accounting and classical forms of hierarchy coordination; Mouritsen and Thrane (2006) on accounting, management control and inter-organizational relations; Kulmala (2002) on Open-Book Accounting in Networks and others.

An interesting view of this problem is presented in the work under the scientific supervision of Carlsson-Wall (2018), in which accounting research is correlated with innovations and inter-organizational relations in this form (Figure 4).

Figure 4. Correlation of accounting with innovation and inter-organizational relations according to Carlsson-Wall (2018)




*Source*: Carlsson-Wall (2018)

In the upper left corner, the authors cite the literature on “accounting and inter-organizational relations”, when accounting scholars began to pay more attention to various forms of inter-organizational arrangements, such as strategic partnerships, alliances, outsourcing relationships, and joint ventures.

In the upper right corner, the authors note that accounting affects decision-making regarding the implementation of innovative projects. Thus, Mouritsen *et al.* (2009) describe how accounting affects intra- and inter-organizational innovation processes, and Revellino and Mouritsen (2009) outline how different forms of accounting were part of the coordination of the inter-organizational innovation process in the development of the Italian company Autostrade's Telepass system. It is important to note that an important contribution to the literature on “inter-organizational innovation” was the emphasis on the unpredictable and interactive nature of the innovation process.

The first work that comprehensively covered the new issue of accounting and control in horizontal relations between legally independent organizations was the book “Accounting in Networks” by Håkansson *et al.* (2010). Central to this book were the various theoretical perspectives presented in chapters covering economics perspectives and transaction cost accounting (Anderson, S. and Dekker, H.), accounting and industrial network approaches (Håkansson, H., Kraus, K., and Lind, J.), the theory of the network of “actors” and the study of inter-organizational network relations (Muritsen Y., Mahama H., and Chua V.F.) and perspectives of the institutional theory of accounting in inter-organizational relations (Skapens R. V. and Varoutsa E.).

The last decade is characterized by the increased development of complex business networks, which pose new challenges for accounting. Kireytsev (2011) emphasized the need to create an appropriate accounting system: “The activity of enterprises as components of clusters requires the creation of new management accounting systems. These should be systems of adaptive orientation and satisfy the informational needs of management at the local and regional levels.” A similar opinion was held by Vysochan (2016), who researched establishing the content of creating the concept of cluster accounting.

Creating a management system in the cluster involves streamlining processes to achieve a high level of socio-economic development and increase the competitiveness of the integrated structure. The management system of cluster associations in modern conditions requires the use of new perspective approaches with functional aspects of management to formulate the mission and development strategies. The effectiveness of the management system in the cluster largely depends on information support, an important element of which is accounting. Account information, which is part of the information support of the management system, is an array of data necessary for users to make management decisions.

The new global economy formed in recent years has led to the emergence of accounting, capable of generating data and providing information interaction between economic entities on the one hand, and the other hand providing the maximum level of accounting efficiency within corporate interconnected networks with a high level of commercial security. In addition, significant changes are currently taking place in the internal and external economic environment of the functioning of enterprises, which determines the need to improve the accounting system.

## Conclusions

Thus, all of the above indicates that in modern conditions, cluster associations face the task of creating and effectively using a system of accounting and information support for management and strategic management, which, as a rule, involves significant qualitative changes in the formation of an information field to support the adoption economic decisions. One of the main tasks of accounting is the formation of complete and reliable information about the activities of cluster-type organizations.

In the modern conditions of the formation of a cluster economy, the accounting system is transformed from a source of information for the analysis of the state of economic facts into a complex accounting system of information support to manage an integrated structure. The information purpose of accounting is influenced by global factors, as institutional subjects (regulators of the legal bases of accounting and directly economic subjects) are also included in business integration processes and form relevant accounting and analytical information. Under these conditions, the information mission of accounting changes and becomes interdependent with globalization trends, determining the need for the formation of structured information capable of providing real assistance in making strategic and operational economic decisions.

The conducted research is the initial stage of the process of the theoretical and conceptual development of the accounting and information structure of the management system in the cluster. The following studies will be directed to the development of the fundamental principles of the institutional concept of accounting in the cluster.

## Credit Authorship Contribution Statement

**Oleh Vysochan:** Conceptualization, Methodology, Supervision, Writing – original draft.
**Natalia Stanasiuk:** Investigation, Validation, Writing – original draft.
**Svitlana Honchar:** Investigation, Validation, Writing – review and editing.
**Vasyl Hyk:** Conceptualization, Methodology, Project administration, Writing – original draft.
**Olha Vysochan:** Methodology, Visualization, Writing – review and editing.

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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# Decoding Retail Realities: Traditional Retailers' Outlook on Sales Erosion to Modern Retail Economy

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**Abstract:** *The traditional retail landscape in Indian metropolises has changed significantly in the last several decades, mostly due to the modern retail economy's growth, including corporate chain stores and e-commerce sites. Small merchants have been gradually displaced as a result of this paradigm shift, which has been exacerbated by changed Foreign Direct Investment (FDI) laws that have brought significant money into the Indian market, as well as a rise in consumer disposable income and the wave of digitalization. This study explores small merchants' consequences as they contend with the growing power of organized retail and e-commerce behemoths. Despite earlier research studies mostly focusing on the organized trade's exponential rise due to changing customer behavior, this paper fills this gap by illuminating the traditional retailer's perspective towards the contemporary retail landscape and highlighting the threats to small businesses with a traditional focus. The study uses empirical analysis using tools like SPSS and SEM models to examine the initial troubles faced by small retailers of fast-moving consumer goods (FMCG), highlighting the difficulties they face in competing with the powerful forces of deep discounting, massive sales events, and evolving consumer tastes. This exploratory research analyzed the undermining factors like utilitarian and hedonic, purchasing patterns, menaces, hindrances, pecuniary and location as reasons for the retail paradigm from traditional to modern trade. The outcome emphasized that utilitarian factors like ambience, experience, status, variety, payment modes, single-store distribution and assortment are the drivers behind the explosion of traditional trade by the modern trade in retail economy.*

**Keywords:** small Retailers; organized retailers; e-commerce; traditional Trade; modern Trade; fast moving consumer goods; retail economy.

**JEL Classification:** A22; L81; M31; O33.

## Introduction

The last couple of decades have seen an unprecedented transformation in the dynamic Indian retail sector, fuelled by the pervasive impact of modern retail economy, which includes corporate chain shops and e-commerce platforms. The effects of this evolution are most evident in the big cities, where unorganized retailers have to contend with the established organized retailers of change while navigating turbulences. With a focus on the Fast-Moving Consumer Goods (FMCG) industry, this study dissects the complex web of this retail revolution. Traditional trade commenced in India during the barter system itself, a few million years ago. Gradually barter system reformed from the transaction of goods to the transfer of money for goods or services. Lately, the traditional trade is losing its familiarity with the tremendous increase in Modern Trade and e-commerce trade introduction (Nichit 2020, 796). Modern trade is explained as the organized form of trade with wholesale or retail arrangements generally equipped with the corporate chain model with warehouses and multi-stores.

## 1. Research Background

Modern trade is capitally adopted by the Indian markets, especially in metros (Premchandani *et al.* 2014). Every fifth urban consumer in India buys from a modern trade and every third consumer opts for saver packs for best price deals. Nielsen's (2023) report elaborated that the Modern retail economy in India on average burgeoning at 21.2 percent with various formats like hypermarkets and Supermarkets ranging to 7.5 percent CAGR growth for the year 2023. The tire II and III cities also subsequently showed a steep growth faster than the metro cities in the country.

### 1.1 The Indian Retail Resurgence

The retail industry in India cannot be compared with the retail industry of any other developing and developed countries. The retail sector in India is unique and has typical challenges and developments that cannot be compared to the other nations (Prasad and Rao 2015). The traditional retail segment underwent huge revamping exercises to adopt various new formats like supermarkets, hypermarkets and e-commerce (Sathish and Raju 2010). India being the vast consumer base markets the whole world to eye on the trade capabilities. India has a unique market sector that has certain key features dominated by 15 million Kirana stores which operate on a very slim profit margin of one to three percent per product (Siddharth 2019).

The emergence of multiple new competitors has made the Indian retail business one of the fastest-growing and most dynamic sectors. It contributes more than ten percent to the GDP of the nation and about eight percent of the employment. India came in at number 73 in the 2019 Business-to-Consumer (B2C) E-commerce Index published by the United Nations Conference on Trade and Development (Kathuria and Jain 2012). According to the World Bank's Doing Business 2020 report, India is rated 63rd and is the fifth-largest retail destination worldwide. In India, the retail industry contributes more than 10% of the GDP and employs about 8% of the labor force, or more than 35 million people. By 2030, it is anticipated to generate 25 million new employments. The key elements that attract multinational retail behemoths looking to expand into new markets are India's sizable middle class and its almost untapped retail market, which will accelerate the growth of the Indian retail industry. The purchasing power of urban Indian consumers is growing, and branded products in areas including clothing, makeup, footwear, watches, beverages, cuisine, and even jewellery are progressively becoming popular choices for work and pleasure (Pathak and Gupta 2014). As per the latest estimate conducted by the Boston Consulting Group, the retail industry in India is projected to attain a staggering valuation of US$ 2 trillion by 2032 (BCG 2023).

The Indian Retail Industry cannot be compared with the European markets as it includes a huge chunk of the unorganized segment about eighty-eight percent (Invest India 2023). The strategies in the developed nations do not hold relevance to India. India clutches huge consumerism with the second largest consumer base, rising disposable income, changing lifestyles mounting with working women growth and brand proliferation resulting in retail Modernization (Bhattacharyya 2012). These tractions magnets investors globally, and with favoring FDI policies of the country the nation is witnessing huge expansion in the organized corporate business in this segment (Mukherjee *et al.* 2014).

### 1.2 Indian FMCG Industry

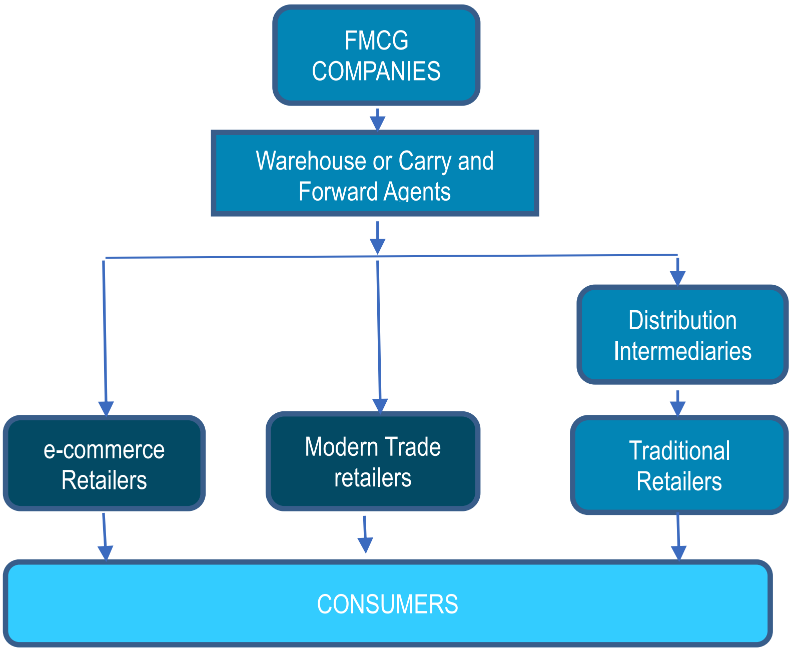
Rising product costs, particularly for necessities, and consumer-driven growth contributed to the FMCG sector's expansion in India. Three million people are employed in the FMCG sector in India, which makes up around 5% of all factory jobs in the country. In terms of revenues, FMCG sales were predicted to increase by 7-9 percent in the nation in 2022–2023. Favorable government initiatives and laws, a growing rural market and youth population, newly branded items, and the expansion of e-commerce platforms are the main growth factors for the industry. The production process, day-to-day operations, retail and logistical channels, consumer insights, and communication all need to prioritize resilience if FMCG companies are to endure over the long term and provide greater value for their customers (Arya 2018). In the April–June 2023 quarter, India's fast-moving consumer goods (FMCG) sector experienced its strongest growth in eight quarters, rising 7.5 percent by volume, driven by increased growth in contemporary trade and a renaissance in rural areas.

The fast-moving consumer goods (FMCG) industry, which is the fourth-largest in India, has been growing at a healthy rate over the years due to factors including rising disposable income, an increase in the number of young people, and increased consumer brand awareness. Half of India's FMCG sales are in the home and personal care categories, making this business a significant contribution to the country's GDP. The sale of FMCG products is grounded on three major pillars Traditional Trade (Unorganized), Modern Trade and e-commerce throughout the country. The growth of FMCG is expected to rise to 27.9 percent from 2023 to 2029. The Urban segment of FMCG contributes a maximum of about two-thirds of the total revenue of the economy and abides as the growth cause (Kavitha 2012). The major clout is lying at the 'Bottom of the Pyramid' in rural India. Rural India is featured with 700 million consumers of FMCG and contributes fifty percent of the FMCG sales. This sale merely happens in the traditional trade by small retailers only with various sub-formats like mom-and-pop stores, Kirana stores, General stores, madis etc. (Neetu, Himanshu and Pawan 2012). The corporate business houses in the retail segment are eyeing this base as a huge potential growth of the organized sector in India (Ahmad and Vays 2011).

### 1.3 Indian Retail FMCG Framework

Indian Retailing Framework as explained in Figure 1, Various FMCG companies send their products to their warehouse or carry and forward agents, and from there the transit happens in three various paths A, B, and C as explained in Figure 1. In Indian markets, the largest source of distribution of products is through the strong-rooted distribution intermediaries also called the stockiest system in India. This supply chain in Path A constitutes a group of distributors, wholesalers and finally Retailers. These retailers again have a sub-segment of store formats like mom-and-pop stores, General stores, Kirana Stores, Medical stores, specialty stores etc (Nielsen 2022). These are the Small Retailers existed for ages and are also called Traditional Retailers. They will not have direct contact with the FMCG companies but rather purchase in small quantities from local distributors or middlemen (Business Line 2019). The commissions are less when compared to the other trade as there are plenty of middlemen to share. They work on a bare minimum margin ranging from one to five rupees per product.

Figure 1. Indian Retail FMCG Framework




*Source:* Authors Compilation.

Path B is the fastest-growing chain at a CARG of 25 percent per annum. Out of 90 Fast Moving consumer products, the modern trade contribution of 43 products like Cheese, Breakfast Cereals, hand wash, olive oil, Body washes, and packaged rice, was almost 70% of the modern trade sale. Big sale days by all the corporate chains conducted in January, May, August and Diwali sales absorb huge footfalls grabbing 15 to 17% of total Modern trade contribution sales. The FMCG categories like chocolates, washing powders, salty snacks, diapers, deodorants, packaged tea, packaged rice of saver packs and large packets contribute to the maximum sale of FMCG in modern trade. These modern trade companies buy large quantities from FMCG companies and maintain separate Distribution Centres for local store-level distribution.

According to a Nielsen report (2023) conducted on the 10 metros contribute 85 percent of the total modern trade business in the country. Chennai stands first with the highest Modern trade sales with 40 percent and Pune follows with 35%. The Omni-channel operational strategies will continue to emerge and rapid the growth of modern retail economy and shopper count (Buch 2019). Modern retail formats are creating repeated consumers with their reasonable price offerings and high level of shopping experience (Ravi and Bhagat 2017).

Path C explained the e-commerce networks that buy stocks directly from the FMCG companies and supply to the end consumers through digital platforms. The increased internet penetration, enhanced consumer digital knowledge, and rising infra standards are breeding online e-commerce sales in the country (Shetty 2017). It is projected that the e-commerce market in India will grow from US$ 111 billion in 2024 to US$ 200 billion in 2026 (IBEF 2023). Over the last three years, the number of internet shoppers in India has increased to 125 million, and by 2025, an additional 80 million are anticipated. This trade is in the nascent stage in India but with a promising growth rate. The round-the-clock working hours, convenience, door deliveries, and easy return policies encourage more consumers to opt the digital platforms.

Despite consumers' persistent preference for online and digital trade, small grocery stores are enjoying a revival in business, with sales reaching pre-pandemic levels and higher product stockings. Many urban and semi-urban Indian marketplaces are seeing a balance between traditional trade and new channels, even though tiny businesses, or kiranas, are doing well. FMCG companies declared they will keep their attention on direct distribution to both rural and urban areas (Business Standard 2023). Nielsen (2023) revealed 1.9 percent volume growth in conventional trade with small grocers leading the way. The positive growth in modern commerce reached its highest quarterly pace during the January-March period, at 14.6 percent. Traditional trade is showing signs of recovery for the first time in quarter one of 2023 post-Covid, with a 1.9% increase in consumption led mainly by grocers. Small businesses engaged in traditional trade faced hardships for almost a couple of years (Business Standard 2023).

## 2. Drivers of Paradigm Shift from Traditional to Modern Trade-Empirical Studies

For many Indians, conventional trade channels are the favoured option because of their price and the ease of accessing them from their neighbourhood. For the foreseeable future, these reasons will keep traditional trade channels dominant in the Indian FMCG sector but contemporary retail forms will keep becoming more and more popular, particularly in cities (Sharma 2023). The shift of consumer preference from traditional trade to organized retailers is derived from numerous factors. Hedonic factors are characteristics or elements associated with happiness, pleasure, or emotional health (Calvo-Porral and Lévy-Mangin 2021). These variables are frequently used to assess and comprehend people's subjective experiences in the context of marketing, psychology, and consumer behavior. In the context of consumer behavior and product design, utilitarian and hedonic variables are compared (Arora and Budree 2016). Utilitarian factors are related to a product's performance, efficiency, or durability, among other practical or functional aspects (Bhagat and Ravi 2018). Hedonic variables, on the other hand, concentrate on the sensory and emotional elements of a good or service.

Gowrishankkar (2017) in his study mentioned Ambience is the quiet conductor in the modern retail world, arranging harmonious interactions between customers. The faint scent that permeates the air, the soft glow of ambient lighting, and the ambient music all combine to create an environment that elevates shopping into a multisensory experience which has become an asset for the hypermarket and supermarket sales (Muhammad *et al.* 2014). The assortment of premium brands and exclusive collections has been carefully chosen to appeal to a discerning customer, making purchases a reflection of one's status and taste (Statista 2020). Every aisle exudes a sense of status, and this allure turns every product into a mark of exclusivity for the customers (Stieninger *et al.* 2021). Modern payment technology makes sure that making a purchase is as simple and attractive as the items that are being shown. The payment method itself becomes a component of the hedonic appeal, adding to an overall feeling of convenience and sophistication, from contactless payments to customized reward programs. Contactless payments are adopted in traditional trade but loyalty programs are more exclusive to modern trade which attracts the customer base (Srivastava 2023).

The store's dedication to a single-store distribution approach also adds to the appeal of exclusivity and rarity (Rinoj 2012). A feeling of urgency and importance is created by the limited availability of some things, drawing customers looking for unique gems that are unavailable elsewhere and also creating attraction towards modern trade retailers (Upshaw *et al.* 2017). The wide range of options accommodates a variety of preferences and tastes. The diversity of the modern retail economy, which ranges from historical pieces to cutting-edge works, is a celebration of uniqueness. Every aisle beckons investigation and every shelf tells a tale, so there's always a chance to learn something fresh and a remarkable assortment for the consumer to choose from

(Sweeney *et al.* 2022). The research identified that shopping is a luxury rather than a chore. Knowledgeable and attentive employees make a big difference in the experience by providing individualized support and professional advice. Every purchase is a new chapter in the tale of a customer's distinct and developing style, and the trip through the store takes on the character of a narrative experience that turned out to be a selling point for the modern trade sale (Bascur and Rusu 2020).

In today's continually evolving retail environment, customers are looking for incentives with value in addition to products. "Offers and sales" are two potent factors that can greatly affect consumers' decisions to buy. Buy one, get one free offer, loyalty plans, and time-limited discounts instill customers with a sense of urgency and value (Mutlu *et al.* 2023). A major consideration in the decision-making process of the modern customer is convenience. The emergence of e-commerce has increased demand for delivery services that are quick, easy, and efficient. "Door delivery" is an important factor that can make or break a transaction, not just a convenience (Deepika and Kannan 2023). Modern stores guarantee "payment security" as internet transactions grow more common. Customers want to know that the highest care and security are being taken with their financial information. Customers trust a business that uses strong encryption, secure payment methods, and complies with industry data protection requirements and modern trade wins this race (Cologgi 2023).

Lavuri (2023) in his study uncovered that volume sales are essential to drawing customers in today's commerce. Customers are encouraged to buy in bigger quantities by discounts and promotions that offer them cost savings per unit (Pantano and Naccarato 2010). To create a win-win situation where customers believe they are getting more for their money and retailers gain from higher transaction volumes, modern trade establishments frequently use volume sales as part of their pricing and promotional strategies. Sharma and Kashyap (2023) in their study explored that the desire of consumers for comfort and predictability is played upon by subscription models or incentives for frequent, planned purchases. Modern commerce may create a steady cash stream, increase client loyalty, and simplify inventory management by providing discounts or special benefits for committing to monthly orders.

Ali and Muhammad (2021) explained that saver packs give customers a one-stop shop for all of their necessities, which not only saves them money but also makes shopping easier for them. By catering to the budget-conscious section of their consumer base, modern trade establishments can increase customer satisfaction and foster repeat business. Smaller retailers are more vulnerable to supply chain disruptions because they may have less bargaining power with suppliers. This may cause product delivery delays, which would make it more difficult to quickly satisfy client demand. If customers are unable to find the products they need from a traditional merchant due to supply lags, they may resort to alternative sources. Losing the trust and loyalty of customers may result from this (Moussaoui *et al.* 2016). Bhatia and Soni (2010) mentioned that customers of modern times can now quickly compare costs from different retailers. It is difficult for traditional retailers to sustain higher pricing without providing extra value or distinctive selling propositions when prices are transparent. Particularly online shops might be able to operate with lesser administrative costs, which enables them to sell products at reduced prices. Modern retailers will operate in huge volumes and work on minimum margins compared to local retailers which causes price infiltrations. Compared to modern trade merchants, traditional trade frequently uses manual methods and lacks the necessary technology infrastructure (Yang and Jun 2008). This includes point-of-sale (POS) systems, customer relationship management (CRM) tools, and inventory management systems. Traditional trade distributors could lack the means or know-how to accept and incorporate cutting-edge technologies. As a result, their operational speed, accuracy, and efficiency are all negatively impacted (Ahmad and Dixit 2021).

Vetrivel and Solayappan (2016) In their research identified that it could be difficult for conventional trade distributors to streamline their supply chain procedures. Reliance on manual procedures can result in cost increases, inefficiencies, and longer lead times, making it harder to compete with the efficient supply chains of contemporary retailers resulting in supply chain inefficiency. Traditional trade sellers make less money on each sale since their commissions are lower. Their profit margins are directly impacted by this, which makes it difficult for them to pay for renovations, cover operational costs, or compete with contemporary trade shops that might provide more alluring commission plans (Rani 2013).

For conventional trade sellers, the combination of high carrying costs and decreased commissions can create a difficult business environment. These companies might have trouble continuing to operate in the long run if they are unable to turn a profit. Closures or a drop in the calibre of services provided could result from this (Sinha *et al.* 2015). This Horizontal competition phrase refers to the rivalry between companies that cater to the same clientele and provide comparable goods or services (Srinivasu 2014). Because they are aiming for the same customer base, a Kirana store and a medical supply store that sell comparable everyday goods (such as over-the-counter drugs, toiletries, snacks, etc.) are in horizontal competition. This can also affect the traditional trade effectiveness (Hemalatha and Najma 2013).

In their study, Thakkar and Swati (2009) elaborated that traditional stores usually have physical premises where they sell products to walk-in customers. They aim to attract and cater to a clientele that shares their requirements, tastes, and shopping habits, resulting in the sharing of consumerism and direct competition.

## 3. Research Methodology

This present research is an empirical-based study with primary data collected from 432 respondents from Bengaluru city. The study's respondents were the small retailers (traditional trade) of General stores, Kirana Stores, Medical Stores and Mom and Pop stores (Pan Shops) selling FMCG products. This research was conducted in the time frame of January'23 to August'23. This study focused on exploring the perceptions of traditional retailers about withstanding challenges in the intense market competition with modern trade and the e-commerce business giants. This study is conducted in two parts. The initial part is a qualitative study that identified the Indian Retail FMCG framework and the 21 major issues of diminishing traditional retailers both in number and profits. The later study conducted a detailed quantitative study on analysing the reasons and challenges of the downfall of traditional trade in comparison with modern and e-commerce fronts. The respondents' opinions were collected on a five-point Likert scale recording their statements regarding twenty-one factors of losing their business for modern trade and e-commerce competition. The snowball sampling technique is used and the statistical tool of exploratory factor analysis is conducted. IBM Amos 26 tool was used to frame the Structured equation model and check the validity and reliability of the data.

## 3. Data Examination

The literature review assisted in the identification of variables of the paradigm shift to consumer preferences from traditional retail to modern trade, Factor analysis is identified to be an appropriate exploratory test to analyze the outlook of traditional retailers. To proceed with an acceptable factor analysis, the KMO assesses the sampling adequacy, which indicates whether the responses provided with the sample are adequate or not and the value must be closer to 0.5. According to Kaiser (1974), values above 0.9 are excellent, values between 0.7 and 0.8 are acceptable, and 0.5 is the minimal (barely accepted) value for KMO. The KMO measure in the above table is 0.865, which is greater than 0.5 and can be accepted for validation to conduct further analysis as shown in Table 1.

Table 1. KMO and Bartlett's Test

| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | 0.865 |
|---|---|---|
| Bartlett's Test of Sphericity | Approx. Chi-Square | 5037.637 |
| | df | 210 |
| | Sig. | .000 |

An additional measure of the strength of the association between the variables is Bartlett's test. It can be observed that Bartlett's Test of Sphericity is significant from the above table which is (0.000). In other words, the significance is below 0.05. Since the actual value is 0.000, we can accept the null hypothesis and proceed to analyze all the variables.

Table 2. Communalities

| Variables | Extraction |
|---|---|
| Supply Lags | 0.762 |
| Lack of technical knowledge | 0.841 |
| Increase in Overheads | 0.695 |
| Payment modes | 0.786 |
| Door Delivery | 0.762 |
| Offers and Sales | 0.802 |
| Variety | 0.656 |
| Volume Sales | 0.807 |
| Savor Packets | 0.587 |
| Payment Security | 0.803 |
| Competitors | 0.868 |
| Less Margins | 0.854 |
| High no of traditional stores | 0.689 |

| Variables | Extraction |
|---|---|
| Ambience | 0.808 |
| Monthly Orders | 0.819 |
| Distributors dependency | 0.859 |
| Assortment | 0.767 |
| Experience | 0.804 |
| Single store distribution | 0.797 |
| Price Infiltration | 0.785 |
| Status | 0.714 |

The communalities Table 2 shown above demonstrates the variance (*i.e.*, the communality value, which needs to be greater than 0.5 to be taken into consideration for additional analysis) or the values that are lesser than that should be eliminated for additional study. More than 86.8% of the variance in "Competitors" and 58.7% of the variance in "Savor packets as shown in (Table 2). The variance for all the factors is above 0.50. So, all the variables can be taken for further analysis.

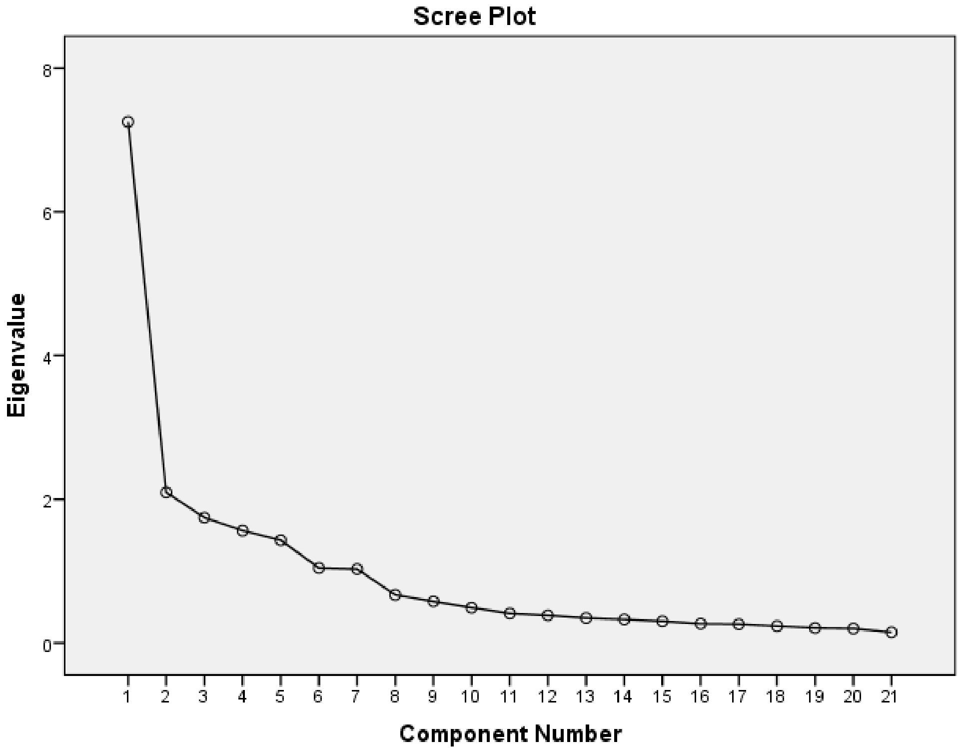
Table 3. Total Variance Explained

| Component | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | | | Rotation Sums of Squared Loadings | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % | Total | % of Variance | Cumulative % |
| 1 | 7.254 | 34.545 | 34.545 | 7.254 | 34.545 | 34.545 | 4.288 | 20.418 | 20.418 |
| 2 | 2.096 | 9.98 | 44.525 | 2.096 | 9.98 | 44.525 | 2.429 | 11.568 | 31.986 |
| 3 | 1.746 | 8.314 | 52.839 | 1.746 | 8.314 | 52.839 | 2.259 | 10.758 | 42.743 |
| 4 | 1.564 | 7.448 | 60.287 | 1.564 | 7.448 | 60.287 | 2.178 | 10.373 | 53.116 |
| 5 | 1.432 | 6.82 | 67.107 | 1.432 | 6.82 | 67.107 | 2.172 | 10.343 | 63.459 |
| 6 | 1.043 | 4.967 | 72.074 | 1.043 | 4.967 | 72.074 | 1.499 | 7.14 | 70.598 |
| 7 | 1.029 | 4.902 | 76.976 | 1.029 | 4.902 | 76.976 | 1.339 | 6.377 | 76.976 |
| 8 | 0.67 | 3.19 | 80.166 | | | | | | |
| 9 | 0.579 | 2.755 | 82.921 | | | | | | |
| 10 | 0.492 | 2.341 | 85.261 | | | | | | |
| 11 | 0.412 | 1.962 | 87.223 | | | | | | |
| 12 | 0.384 | 1.83 | 89.052 | | | | | | |
| 13 | 0.348 | 1.657 | 90.71 | | | | | | |
| 14 | 0.328 | 1.561 | 92.27 | | | | | | |
| 15 | 0.302 | 1.436 | 93.707 | | | | | | |
| 16 | 0.268 | 1.274 | 94.981 | | | | | | |
| 17 | 0.261 | 1.244 | 96.225 | | | | | | |
| 18 | 0.235 | 1.118 | 97.343 | | | | | | |
| 19 | 0.208 | 0.993 | 98.336 | | | | | | |
| 20 | 0.201 | 0.959 | 99.295 | | | | | | |
| 21 | 0.148 | 0.705 | 100 | | | | | | |
| Extraction Method: | Principal Component Analysis. | | | | | | | | |

The number of retrieved factors whose sum should be equal to the number of items undergoing factor analysis is reflected in the Eigenvalue. The factors that can be extracted from the analysis and their eigenvalues are displayed in the following item as shown in Table 3. Three subsections comprise the Eigenvalue table: Rotation of Sums of Squared Loadings, Extracted Sums of Squared Loadings, and Initial Eigen Values. Extracted Sums of Squared Loadings have been only taken for further analysis and interpretation.

34.545% of the variance is explained by the first factor, 44.525% by the second, 52.839% by the third variable, 60.287% by the fourth, 67.107% by the fifth factor, the sixth accounted for 72074% and the last seventh factor accounted for 76.976% shown in Table 3. The total variation accounted for all these factors is 76.976% which is found to be acceptable, and therefore it benefits the validity of the study.

Figure 2. Screen Plot




The eigenvalues against each variable are shown in the screen plot (Figure 2 Graph). It is helpful to find out how many components or factors can be retained. Where the curve begins to flatten is the point of interest. It is evident that between factors 7 and 8, the curve starts to flatten. As can be seen, only seven factors can be taken because beyond that factor, the eigenvalues are smaller than one.

## 4. Discussions

Technically, a factor (or component) is the combination of all variables. Our rotated component matrix (above) shows that our first component is measured by v14, v18, v21, v7, v4, v19, v17 shown in Table 4. These all variables relate to the same. Therefore, we interpret component 1 as "Hedonic variables". This is the underlying trait measured by v14, v18, v21, v7, v4, v19, v17. After similarly interpreting all components, we arrived at the following descriptions:

Component 1- "**Hedonic variables**"
Component 2- "**Utilitarian variables**"
Component 3- "**Purchasing Pattern**"
Component 4- "**Menaces**"
Component 5- "**Hindrances**"
Component 6- "**Pecuniary**"
Component 7- "**Location**"

Table 4. Rotated Component Matrix

| Factors | Component | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Ambience | 0.872 | | | | | | |
| Experience | 0.861 | | | | | | |
| Status | 0.819 | | | | | | |
| Variety | 0.72 | | | | | | |
| Payment Modes | 0.657 | | | | | | |
| Single store distribution | 0.632 | | | | | | |
| Assortment | 0.579 | | | | | | |

| Factors | Component | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Offers and Sales | | 0.866 | | | | | |
| Door Delivery | | 0.853 | | | | | |
| Payment security | | 0.85 | | | | | |
| Volume Sales | | | 0.881 | | | | |
| Monthly orders | | | 0.879 | | | | |
| Savor Packets | | | 0.473 | | | | |
| Price Infiltration | | | | 0.854 | | | |
| Supply lags | | | | 0.817 | | | |
| Distributors dependency | | | | | 0.912 | | |
| Lack of technical knowledge | | | | | 0.901 | | |
| Less Margins | | | | | | 0.92 | |
| Increase in overheads | | | | | | 0.661 | |
| Competitors | | | | | | | 0.914 |
| High no of traditional stores | | | | | | | 0.629 |
| Extraction Method: Principal Component Analysis. | | | | | | | |
| Rotation Method: Varimax with Kaiser Normalization. | | | | | | | |

The descriptive Table 5 shows the interpretation of the factors with mean computation and 1-5 scale variables. This allows the researcher to infer that "**Hedonic variables**" are ranked best (roughly 4 out of 5 points) and "**Utilitarian**" is ranked low (roughly 3.4 out of 5).

Table 5. Descriptive Statistics

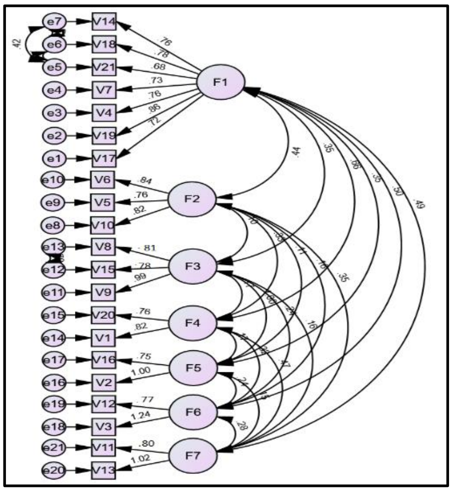
| Factors | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| Hedonic | 432 | 1 | 5 | 3.86 | 0.737 |
| Utilitarian | 432 | 1 | 5 | 3.47 | 0.986 |
| Purchasing Pattern | 432 | 1 | 5 | 3.54 | 0.873 |
| Menaces | 432 | 1 | 5 | 3.62 | 1.004 |
| Hindrances | 432 | 1 | 5 | 3.49 | 0.941 |
| Pecuniary | 432 | 1 | 5 | 3.72 | 0.798 |
| Location | 432 | 2 | 5 | 3.59 | 0.742 |
| Valid N (listwise) | 432 | | | | |

A wide range of model fit statistics is used to evaluate or characterize the overall model fit. The most often reported fit statistics include the Root Mean Square Error of Approximation (RMSEA) with its lower and upper confidence interval limits, the Tucker-Lewis Index (TLI), the chi-square (labelled Discrepancy), its degrees of freedom (DF), and its probability value (P). Standardized Root Mean Residual, or Standardized RMR, is an additional fit index that is only available for complete datasets and will not be printed for incomplete databases. The chi-square test is an absolute test of model fit; a model is considered acceptable if the probability value (P) is 0.5 or above.

The fit output includes a wide range of model fit statistics used to evaluate or characterize the overall model fit. The most often reported fit statistics include the Root Mean Square Error of Approximation (RMSEA) should be equal to .09(.05-.10 moderate) and its lower and upper confidence interval limits, the Tucker-Lewis Index (TLI), the chi-square (labelled Discrepancy), its degrees of freedom (DF), and its probability value (P).

Standardized Root Mean Residual, or Standardized RMR, is an additional fit index that is only available for complete datasets and will not be printed for incomplete databases. The chi-square=609.818, df=130 and p=0.000 test is an absolute test of model fit; a model is considered acceptable if the probability value (P) is 0.5 or above.

Figure 3. SEM Model




Hu and Bentler (1999) advocated that the Normed Fit Index (NFI) be as high as.90 (Anderson and Gerbing, 1988), the Tucker-Lewis Index (TLI) be as high as .90, the Goodness of Fit Index (GFI) be as high as .80, the Relative Fit Index (RFI) be as high as .90, and the Comparative Fit Index (CFI) be as high as.90. According to the descriptive measures of fit, the model fit well since its RMR is.049, NFI is.907, GFI is.883, IFI is.926, CFI is.925, RFI is .900, and TLI value is .907, as shown in the table below (Table 6). The fit indices for the First-Order CFA are detailed in Table 6.

The confirmed GFI, CFI, TLI, IFI, RMR, and NFI values fulfill the conditional cut-off values. The model fits the data well and thus, it may be said that these seven elements Hedonic, Utilitarian, Purchasing Pattern, Menaces, Hindrances, Pecuniary, and Location explain that consumers prefer organized trade over unorganized trade. Thus, it is possible to infer from the fitness indices that the constructs of Hedonic variables which can be measured by seven factors such as (ambience, experience, status, variety, payment modes, single store distribution and assortment) is a good fit, with majority of indices satisfying the recommended cut-off values.

Table 6. Measurement Model Evaluation: Goodness-of-Fit Statistics

| Model | Final Values | Desired Values |
|---|---|---|
| GFI | 0.883 | >.80 sometimes permissible |
| TLI | 0.901 | .90 or higher |
| NFI | 0.907 | .90 or higher |
| RFI | 0.9 | .90 or higher |
| IFI | 0.926 | .90 or higher |
| CFI | 0.925 | .90 or higher |
| RMR | 0.049 | .05 or lower |
| RMSEA | 0.09 | .05-.010 moderate |
| Chi-square/CMIN/DF | 4.691 | <5.0 permissible |

## Conclusions

With the intense competition between traditional trade versus modern trade and e-commerce, organized retail established itself as a superior experience provider (Ravi & Prasad 2020). The traditional trade is confronting a knockout situation in competing with organized trade, especially in metro cities. This study explored the reasons in declining of traditional trade in the Indian retail landscape from the perspective of small retailers. From this study, it is concluded that the dominance of organized trade over unorganized is primarily dependent on Hedonic variables. This factor includes attributes like ambience, experience, status, variety, payment modes, single-store distribution and assortment which impact consumers to prefer organized trade over traditional. The second most influencing factor was identified as the Utilitarian variable which includes offers and sales, door delivery, and payment security. The study also confirmed that the location variable (proximity and high no of traditional stores) was the least impacting factor in consumers opting for organized trade over traditional. This research uncovered the small retailer's concerns to strive for market share. With the maximum middle and upper-middle-class families with a high awareness of technology and trends, the danger of rapid decline is relatively high in metros as compared to tier II and tier III cities.

With the unpredicted lockdown in the country organized retail industry took a massive hit and reopened small retailers an opportunity to gain sales (ET Retail, 2020). The local retailers of the necessary goods reported profits with the human relation of the local consumer base. A report by Hindustan Times (May, 2020) confirmed that 8 million small retailers supplied the needs of the households by making resilience. Thus, consumers' trust and dependency on the local small retailers ricocheted with limited slot deliveries and restricted location deliveries of organized sector sales of modern trade. Thus, new opportunities unfolded for the small business from 'Striving for Existence' to 'Thrive for Profits'. The fortune of re-holding the consumer base encountered in the unorganized retail industry during the pandemic times and the future of continuing the trend is on retailers' majorly on focusing on Hedonic and utilitarian factors as elaborated in this research.

## Future Study

In the present study, the data was only collected from Bangalore city and therefore may not be generalized for the entire country or other developing nations. The findings of this study were purely based on the traditional retailer's perspective and may be prone to bias. Future studies can be conducted regarding this study with consumer opinions and modern trade retailer's opinions and can also be conducted on the existence of traditional FMCG distribution systems across developing nations. Similar studies can also be conducted in other segments beyond FMCG and simultaneously comparative research also can be performed with timeline analysis.

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## Credit Authorship Contribution Statement

**Shikha Bhagat**: conceived and presented the idea. She also formulated the objectives of the study, identified the sample size, and developed the questionnaire. She also conducted the data analysis and results. All the authors together contributed to the conclusions, limitations, future study, and implications.
**Shilpa Sarvani Ravi**: developed the theory and performed logical computations. She also formulated the objectives of the study, identified the sample size, and worked on the literature review. All the authors together contributed to the conclusions, limitations, future study, and implications.
**Mallika Sankar**: developed the theory, performed logical computations, and worked on the introduction. All the authors together contributed to the conclusions, limitations, future study, and implications.

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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# Economics of Fiscal Dominance and Ramifications for the Discharge of Effective Monetary Policy Transmission

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**Abstract:** *This paper explores the intricate dynamics of fiscal dominance and its profound implications for monetary policy efficacy, contributing to the discourse on the interplay between fiscal and monetary policies. The theoretical foundation critically examines existing literature, integrating empirical evidence to construct a comprehensive understanding. Model blocks strategically elucidate the significance of fiscal variables in shaping monetary transmission mechanisms. The ensuing analysis scrutinises the disruptive potential of fiscal dominance on conventional monetary policy tools. The conclusion navigates policy recommendations, emphasising the necessity of coordinated fiscal-monetary strategies to effectively mitigate inflationary pressures. This research provides a nuanced perspective for policymakers, offering theoretical depth and empirical insights to guide decisions in addressing the complex challenges posed by fiscal dominance in economic governance.*

**Keywords:** fiscal dominance; monetary policy; inflationary pressures; economic growth.

**JEL Classification:** E31; E52; H62.

## Introduction

In the realm of economic policymaking, the intricate interplay between fiscal and monetary policies has become a central focus (Jackson 2016). This paper is crafted to unravel the complex relationships inherent in the economics of fiscal dominance, with a specific emphasis on its theoretical underpinnings and implications for the effective execution of monetary policy. Distinct from empirical studies, the paramount objective here is to contribute significantly to the theoretical foundations that underlie our understanding of how fiscal dominance shapes the dynamics of monetary policy transmission. Through a synthesis of established economic theories, empirical evidence, and model blocks, the subsequent sections delve into the nuances of fiscal dominance, accentuating its theoretical impact on the intricate web of monetary policy variables. The analytical framework constructed herein strives to offer theoretical depth, paving the way for insightful policy recommendations. This paper thus stands as a theoretical contribution, enriching the discourse on fiscal-monetary coordination and providing valuable insights for policymakers navigating the theoretical intricacies associated with inflationary pressures.

The relevance of this theoretical study is underscored by the evolving landscape of fiscal and monetary policies, particularly in an era marked by unconventional monetary measures and unprecedented fiscal interventions, such as those witnessed post-2008 and in response to the COVID-19 pandemic. While empirical studies contribute vital insights into the practical manifestations of these policies, this paper firmly anchors itself in the realm of economic theory. Notably, recent theoretical discussions, as exemplified by works like Mawejje and Odihambo (2022) and Sharma, Fatima, Alam and Bharadwaj (2023), emphasise the need for a robust theoretical framework to comprehend the intricate relationships between fiscal and monetary policies. Mawejje and Odihambo (2022) and Warburton and Jackson (2023 and 2023) delve into the theoretical nuances of fiscal dominance in a low-interest-rate environment, offering conceptual clarity on the challenges posed. Sharma (2023) contributes to the ongoing theoretical discourse by exploring the nonlinear dynamics between fiscal and monetary policies. Thus, this paper positions itself within the contemporary economic context, drawing on these theoretical advancements to deepen our understanding of the intricate theoretical dimensions of fiscal dominance and its implications for monetary policy transmission.

## 1. Theoretical Foundation and Review

The theoretical foundation of this paper rests upon a synthesis of contemporary economic thought that underscores the intricate relationships between fiscal and monetary policies. In the ever-evolving landscape of economic governance, understanding the theoretical underpinnings of these policies is paramount. Recent works, such as Blanchard (2019), have emphasised the importance of theoretical frameworks in comprehending the challenges posed by low interest rates and elevated levels of public debt. Blanchard (2019) argues that the theoretical foundation must be robust to address the complexities of fiscal and monetary policy interactions, providing a starting point for our exploration.

A key theoretical insight guiding the approach of the study is the concept of fiscal dominance. This concept has gained prominence in the literature as policymakers grapple with unconventional monetary policies and extraordinary fiscal measures. Kinda, Andras, and Kaustubh (2022) contribute to this discourse by highlighting the potential for fiscal dominance in an environment of persistently low interest rates. Their theoretical analysis suggests that fiscal policy may exert a more significant impact on economic outcomes in such circumstances. In delving into the theoretical foundations, acknowledging the distinct characteristics of fiscal dominance becomes crucial for understanding how fiscal and monetary policies intertwine.

The importance of monetary policy as a cornerstone of economic stability cannot be overstated. Mawejje and Odihambo (2022) provides theoretical insights into the challenges associated with fiscal dominance in a low-interest-rate environment, emphasising the need for a well- articulated monetary policy framework. This theoretical perspective aligns with the growing recognition of the interplay between fiscal and monetary policies, as highlighted by Diallo and Mendy (2018). Their theoretical exploration of fiscal dominance and inflation expectations posits that coordinating monetary and fiscal policies is imperative for managing inflationary pressures effectively.

Empirical studies, such as those by Kinda *et al.* (2022) and Diallo and Mendy (2018), provide tangible evidence supporting the theoretical constructs. Kinda *et al.* (2022) empirically demonstrate the challenges posed by fiscal dominance in influencing economic outcomes, offering a bridge between theory and real-world implications. Diallo and Mendy (2018) and Jazbec and Banerjee (2017) contribute by empirically examining the impact of fiscal dominance on inflation expectations, emphasising the need for the theoretical frameworks to guide policy coordination.

In essence, the theoretical foundation of this study rests on a distinct understanding of fiscal dominance, recognising the symbiotic relationship between fiscal and monetary policies. The works of Blanchard (2019), Mawejje and Odihambo (2022), and empirical insights from studies like Kinda *et al.* (2022) and Diallo and Mendy (2018) collectively provide a comprehensive framework for exploring the Economics of Fiscal Dominance.

## 2. Model Blocks

This section delves into the intricate relationship between fiscal and monetary variables by introducing two pivotal models, [ModelX] representing the Monetary block and [ModelY] embodying the Fiscal block. These models are carefully selected to not only underscore the individual roles of fiscal and monetary policies but also to illuminate their interlinkages. The equations presented below are equipped to provide a theoretical foundation for understanding how fiscal dominance can potentially impede or enhance the effectiveness of monetary policy tools.

Model X (Monetary Block):

$$\Delta it = (\Delta Gt - \Delta Tt) - \beta\Delta mt + \varepsilon t \quad \text{Eq. 1}$$

In Model X, representing the Monetary block, the change in the nominal interest rate ($\Delta it$) is determined by the impact of fiscal policy ($\Delta Gt - \Delta Tt$) and the change in the money supply ($\Delta mt$). The coefficient α captures the sensitivity of the interest rate to fiscal variables, showcasing the potential influence of fiscal dominance on monetary policy tools. This model allows for an exploration of how fiscal policies may affect the nominal interest rate and, consequently, the overall effectiveness of monetary policy.

Model Y (Fiscal Block):

$$\Delta Yt = (\Delta Gt - \Delta Tt) - \delta\Delta it + \mu t \quad \text{Eq. 2}$$

Model Y, representing the Fiscal block, introduces a dynamic dimension by examining the impact of fiscal dominance on real output ($\Delta Yt$). The equation incorporates fiscal policy ($\Delta Gt - \Delta Tt$), the influence of the nominal interest rate ($\Delta it$), and an error term ($\mu t$). The coefficient δ signifies the sensitivity of real output to changes in the nominal interest rate, providing insights into how fiscal dominance might affect broader economic activity through its interplay with monetary policy.

These models collectively offer a theoretical framework for understanding the intricate dynamics between fiscal and monetary policies and their interlinkages. By explicitly modelling the relationships between fiscal policies and monetary tools, researchers and policymakers can gain deeper insight into how fiscal dominance may manifest and influence the effectiveness of monetary policy tools. Relevant contemporary works produced by Tomsik (2012) and Hofmann, Lombardi, Mojon and Orphanides (2021), underpin the theoretical constructs, ensuring their alignment with current economic thought.

## 3. Analysis of the Model Blocks with Implications for Monetary Policy Transmission

This analytical exploration focuses on dissecting the theoretical models [ModelX] and [ModelY], aiming to unravel the intricate dynamics between fiscal and monetary variables. The starting point of the analytical discourse reflects the study by Barrie and Jackson (forthcoming), which provides valuable insights into the potential impact of fiscal dominance on inflationary pressures. [ModelY] captures the essence of fiscal policies, offering a lens through which we can understand how these policies may influence the effectiveness of monetary tools. By scrutinising the equations and theoretical constructs, this study aims to discern the channels through which fiscal dominance could either impede or enhance the transmission of monetary policy. This theoretical foundation aligns with the broader economic discourse, emphasising the interconnectedness of fiscal and monetary policies.

Extending the analysis to the dynamic perspectives presented in the study by Tomsik (2012), we delve into the nonlinearities inherent in fiscal-monetary interactions. The empirical findings of Tomsik (2012) reveal that fiscal dominance may manifest differently under varying economic conditions, providing a nuanced understanding of the complex interplay between fiscal and monetary policies. Within the analysis of [ModelX], the study assesses how fiscal policies impact the nominal interest rate, a crucial component of the monetary transmission mechanism (Jackson, Barrie and Tamuke 2023). By incorporating these nonlinear dynamics, the analysis seeks to uncover the potential challenges and opportunities associated with fiscal dominance in guiding monetary policy effectiveness.

The theoretical perspectives presented by Hanif, M & Arby (2003) contribute to the study's analysis by shedding light on coordination challenges between fiscal and monetary authorities. While not explicitly modelled in [ModelX] and [ModelY], their insights provide a valuable backdrop to evaluate the practical hurdles in achieving effective policy coordination. These considerations serve as a theoretical framework through which we assess the implications of fiscal dominance on monetary transmission channels. By juxtaposing these theoretical considerations with the real-world implications observed in major economic shocks, such as the 2008 financial crisis and the COVID-19 pandemic, the analysis gains depth. Empirical evidence from Blanchard (2019) and Famous and Claeys (2020) informs an understanding of how fiscal dominance may play out in practice, adding a practical dimension to the theoretical models.

In essence, this analysis section serves as a comprehensive exploration of the Model Blocks, placing a specific focus on their implications for monetary transmission. The models [ModelX] and [ModelY], coupled with insights from contemporary studies, provide a holistic framework for policymakers to navigate the challenges posed by fiscal dominance. This analytical endeavour aims to equip policymakers with a focused understanding, facilitating informed decisions for effective economic governance.

## Conclusion and Relevance for Policy Making

This paper underscores the imperative of adopting a comprehensive and interconnected approach to economic policymaking that acknowledges the intricate relationship between fiscal and monetary policies. The synthesised insights contribute significantly to knowledge development by emphasising the relevance of coordinated fiscal and monetary frameworks in addressing inflationary pressures. The intricacies explored herein underscore that effective economic governance requires policymakers to view fiscal and monetary policies not in isolation but as integral components of a unified strategy. This holistic perspective is especially pertinent in fiscal romance economies, where the distinct dynamics of fiscal dominance play a crucial role in shaping economic outcomes.

For policymakers in fiscal romance economies, the implications derived from this research offer actionable insights into crafting strategies beyond conventional approaches. The recognition of the symbiotic relationship between fiscal and monetary policies becomes paramount in the pursuit of sustainable economic development. The relevance for knowledge development lies in providing a clear understanding of how fiscal dominance may manifest in specific economic contexts, contributing to the evolving discourse on effective economic governance. This paper, therefore, serves as a roadmap for policymakers, offering a theoretical foundation supported by empirical insights to guide decisions that foster economic stability, particularly in fiscal romance economies where these dynamics are central to policy formulation and implementation.

In conclusion, this research advocates for a paradigm shift in economic policymaking towards holistic coordination (also emphasised in Barrie and Jackson's forthcoming study), providing policymakers with a robust framework to navigate the challenges posed by fiscal dominance. By recognising and addressing the interconnectedness of fiscal and monetary policies, policymakers can develop strategies that not only mitigate inflationary pressures but also promote sustainable economic growth. The relevance of this research extends beyond theoretical discourse, offering practical implications for policymakers in fiscal romance economies and contributing substantively to the broader knowledge development in the field of economic governance.

## Declaration of Competing Interest

The author declares that he has no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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# Practical Marketing System as a Solution to Limited Labor and Post-Harvest Processing Areas for Rice

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**Abstract:** *The majority of rice farmers in Denpasar City chose a practical marketing system, this system implements rice sales based on estimated production results. Farmers generally sell their produce when the rice is approaching harvest time. The buyer determines the purchase price for rice by estimating the number of transaction objects after carefully observing and viewing the rice to be harvested. With this system, farmers no longer need to think about the availability of labor to harvest, transport the harvest home, dry the grain until it reaches a certain level of dryness. The novelty of this research is conducting in-depth research on the practice of buying and selling rice using a practical marketing system in Denpasar City. This research will also examine in depth the practical marketing system from two sides, namely from the perspective of farmers and buyers. The results of this research reveal that the practice of buying and selling rice using a practical marketing system in Denpasar City involves farmers as sellers and buyers who are usually called penebas. The reason why farmers choose a practical marketing system is that this system is considered more profitable for farmers with all the limitations of farming in urban areas, where farmers only need to care for the rice they plant until it is ready to harvest.*

**Keywords:** city; rice farming; practical marketing; estimated price; harvest.

**JEL Classification:** J01; Q13; Q21; R11.

## Introduction

Research results regarding farmer decision-making are closely related to rational action. Schoolman *et al.* (2021) stated that the different considerations of farmers in Michigan and Ohio influence the choice of how to market their products, farmers who prioritize community involvement and community institutions are more likely to market food through local institutions while farmers who have a relatively strong sense of responsibility for the environment generally tend not to participate in the local food system. Huber *et al.* (2018) concluded that factors such as non-agricultural activities, heterogeneous household and family characteristics, and the need for short-term and long-term decision-making simultaneously influence the way farmers in Europe make decisions in marketing their products. Abacı and Demiryürek (2019) add that not only marketing, but the selection of products to be produced by farmers in Turkey is also influenced by farmers' rational considerations regarding product characteristics, physical characteristics, farming characteristics, natural factors, irrigation, and labor.

Farmers generally act rationally in marketing their rice crops. Farmers in Denpasar City generally sell their crops based on production estimates (Suardi *et al.* 2023). Farmers generally sell their produce when the rice is approaching harvest time. The buyer determines the purchase price for rice by estimating the number of transaction objects after carefully observing and viewing the rice to be harvested. With this system, farmers no longer need to think about the availability of labor to harvest, transport the harvest home, dry the grain until it reaches a certain level of dryness so that it is suitable for storage, then provide a place to store the rice harvest. This system makes it easier for farmers because farmers directly receive the harvest (in the form of money or rice). After all, the harvesting process is carried out by the buyer.

The number of young farmers continues to decline, both relatively and absolutely, then on the other hand the increasing number of older farmers shows the rice farming that is currently happening in Denpasar City. These problems have an impact on physical strength and it is difficult to find workers. The harvesting process requires physical strength and quantity of rice harvesting workers. Suess-Reyes and Fuetsch (2016); Bilewicz and Bukraba-Rylska (2021); K. Brown *et al.* (2021) said that the decline in the number of young farmers was also occurring in Europe and Australia, which was caused by a combination of social factors (erosion of community life, conflict between entrepreneurial farmers and small farmers, as well as increasing distrust, economic, environmental and institutional challenges. Balezentis *et al.* (2020) reported that the influence of the Young Farmers' Support policy implemented by the European government had a positive impact on the existence of young farmers, especially small farmers in Lithuania. May *et al.* (2019) stated that this policy was also concluded to have a positive impact on farmer regeneration.

Furthermore, May *et al.* (2019) stated that other factors that influence the will of young farmers are pessimism towards agriculture, community and family integration, participation in decision-making, and neighbors' opinions. Wójcik *et al.* (2019); Sroka *et al.* (2019); Coopmans *et al.* (2021), adds that other factors that influence the willingness of young farmers are the availability of land and family, agricultural characteristics (agricultural land area and economic size) and manager characteristics, including education. Yeboah *et al.* (2020) argued that farmer regeneration is important to improve the village economy in Africa. Góngora Pérez *et al.* (2020); and Grubbström and Eriksson (2018) also stated that the younger generation in agriculture plays a role in maintaining the sustainability of agricultural activities and strengthening the provision of healthy products for human consumption.

The limited availability of agricultural labor and harvesting support facilities means that the role of buyers with an assessment system is very much needed by farmers because farmers do not need to pay harvest costs or labor costs (Suamba *et al.* 2023). This system is considered practical because farmers get their production results in the form of money directly. An estimation system (estimate) is carried out by sellers and buyers of all rice products by looking at and circling the rice fields to interpret the total amount of rice harvest before harvest. This system allows for speculation by both parties because the quantity and quality of rice are not yet known and the correctness of the calculations without perfect measurements.

The study by Nurliza (2023) in Indonesia shows that the relationship between income and characteristics of small rubber farmers regarding cultivation and income from post-harvest management is not significant. Furthermore, Kaminski & Christiaensen (2014) stated that annual adjustments in Africa were necessary to avoid underestimating or underestimating total losses in agricultural land. Based on this, this is one of the risks for buyers using the harvest estimation system because the quantity and quality of rice is not yet clearly known before harvest.

Research carried out in-depth on the practice of buying and selling rice with a practical and effective marketing system in Denpasar City is new in this research. The novelty of this study lies in conducting in-depth research on the practice of buying and selling rice using a practical marketing system in Denpasar City. The study also examines the practical marketing system from the perspectives of both farmers and buyers. This research is important as it provides a comprehensive understanding of the practical marketing system in rice farming, particularly in urban areas with limited availability of agricultural labor and limited area for post-harvest processing. Additionally, this study addresses the challenges faced by rice farmers and buyers in Denpasar City, offering insights into decision-making, risk management, and the dynamics of the practical marketing system.

## 1. Literature Review

Wati *et al.* (2021) farmer regeneration is one of the most critical factors in ensuring agricultural sustainability. The agricultural sector requires production personnel who are skilled, professional, and able to utilize technological developments. The low availability of agricultural resources is one of the factors for the slow renewal of Indonesian farmers. This condition is not only caused by agricultural knowledge that has yet to be passed on to the younger generation by parents or the community. But there are other things, such as changes in family, school, farming, and non-agriculture, which alienate the younger generation from their environment. Susilowati (2016) adds that the low interest of the younger generation is also caused by the image of the agricultural sector, which is less prestigious, high-risk and does not guarantee income levels, stability, and continuity; low average land ownership; diversification of non-agricultural businesses and agricultural industries in underdeveloped/underdeveloped villages; standard agricultural management; no particular incentive policies for young/starting farmers; and changes in the perspective of young people in the current postmodern era.

Taufiqurrohman and Jayanti (2022) explained that the Thai concept supporting farmer renewal can be applied to Indonesia. This is due to the existence of serious social problems for Indonesian farmers. There are three concepts, namely the provision of fertile land ready for harvest, available financing, and efforts to advance the agricultural profession in a positive and mutually sustainable manner, which must be translated into a regulatory framework to revitalize Indonesian farmers. Furthermore, Ranzez *et al.* (2020) added that the parents' role could also support farmers' regeneration as an external factor.

The novelty of this research is conducting in-depth research on the practice of buying and selling rice using a practical marketing system in Denpasar City. This research will also examine in depth the practical marketing system from two sides, namely from the perspective of farmers and buyers. It is hoped that the results of the research will provide a comprehensive picture of the practical marketing system in rice farming so that various controversies regarding the existence of buyers in the practical marketing system can be answered clearly.

## 2. Method

This research is located in Denpasar City, Bali Province. Based on initial observations, this research uses 36 Subaks as research objects out of a total of 41 Subaks in Denpasar City. This is because the other 5 Subaks do not grow rice and Subak members do not use the slashing system. According to Lanya *et al.* (2015), All rice fields in Bali are part of the Subak organizational system. The Subak organizational system is agreed to belong to the Balinese traditional community which is recognized nationally in Indonesia and is considered a world cultural heritage.

The population in this study were all farmers who were members of 36 Subaks in Denpasar City. The total number of farmer respondents taken was 318 farmers, who implemented a practical marketing system. Apart from farmers, this research also took 40 rice buyers as respondents. This research also included 36 Subak Chairmen as respondents. The data collection method used in this research is a survey and structured interviews, namely interviews using instruments using prepared questionnaires. This research uses four variables with 42 indicators.

The first objective of this research was analyzed using descriptive analysis methods. Descriptive analysis in objective one is based on the views and thoughts of farmers in Denpasar City as the research object and looks as closely as possible at the study target in its current conditions. In this research, quantitative data was also collected. The quantitative data collected will be used to support qualitative analysis.

The second objective of this research was analyzed using a descriptive analysis method using the Guttman scale to determine the basis for farmers' decision-making in choosing a slashing system in Denpasar City in terms of eight bases, namely intuition, experience, data, research, standards, facts, authority, and logical/rational. Objectives three and four in this research were analyzed using qualitative and quantitative descriptive analysis methods. The presentation of data for objectives three and four will be presented in table form (simple tabulation) so that it is easy to understand the aspects studied. Before analysis, all data obtained is checked to minimize the possibility of errors or follow editing, coding, and tabulation procedures. Objective five is to create a practical marketing system model for rice farming in urban areas. In preparing the model, it is focused on the findings of objectives one, two, three, and four.scale.

## 3. Research Results

### 3.1 Rice Buying and Selling Practices with a Practical Marketing System

Buyers play a role in determining the harvest time of the rice they buy (Darmawan *et al.* 2023). The buyer will conduct a survey of the farmer's lands that will be targeted when the harvest season arrives. Buyers will make considerations based on the area of land, and the condition of the rice and make comparisons with information obtained from farmers regarding previous harvest results. The survey carried out will determine the buyer's decision as to whether the land is suitable for purchasing the harvest or not. If the survey results are considered profitable, the buyer will convey the estimated price to the farmer who owns the land. (Britos *et al.* 2022; Sroka *et al.* 2019) Important price estimates are also based on the level of land distortion with the market and road accessibility.

In interpreting the purchase price, apart from looking at the area of land which is generally calculated per unit acre, and the condition of the rice, the harvester also takes into account the labor wages that must be paid at the time of harvest. This is because it is the slasher who provides the labor for the harvesting process. (Promkhambut *et al.* 2023) concluded five factors causing the success of small farmers in Thailand in maintaining their land, namely access to resources, labor in the agricultural sector, agricultural inputs, agricultural funding, and government support. Zou *et al.* (2018) stated that the limited workforce/subsequent farmers caused a decrease in the number of workers, but the grain subsidy policy by the government in China caused an increase in land rental by older farmers. Furthermore, Blanc *et al.* (2008) stated that the increase in farmers choosing to hire labor to work on their land and the constant number of workers led to a slight increase in labor wages in Europe. Farmers certainly have an important role in ensuring that the harvest is good. Farmers prefer to use a practical marketing system to sell their crops because the buyer pays all expenses, and the farmer only receives net money from the harvest. Farmers save energy because they no longer need to dry rice and do not need to supervise the rice harvesting process in the fields.

The assessment time carried out by buyers before determining the price to be offered to farmers is quite varied. This depends on several factors, including the rice variety planted by the farmer and the season. The assessment time by buyers before harvest is quite varied. 66.7% of buyer respondents carry out an assessment 7-14 days before harvest. The majority of farmer respondents contacted buyers without going through the Head of Subak. Meanwhile, several respondents met, and farmers needed the Subak Chair's help to contact buyers. Most buying and selling transactions between farmers and buyers are not outlined in written agreements, this is because the transactions carried out are based on the farmer's sense of trust in the buyer. Most of the transactions carried out by respondents were in the form of cash, and transactions were also found in the form of rice obtained from milling grain. The transaction that occurs will be tied to the buyer giving an advance payment to the farmer. The range of down payments given depends on the size of the land.

The conflicts that occur are quite diverse, conflicts caused by climate or weather factors, conflicts originating from buyers, and several other conflicts. Conflicts related to payment problems by buyers to farmers, conflicts related to harvesting schedules that are later than the agreed schedule. Buyers do not make payments to farmers and buyers also delay payment in full to farmers. The price agreed at the beginning is not the same as the final price paid to the farmer. This is because buyers are dissatisfied with the harvest results. Even though the harvest results did not match what was expected, this occurred due to pests and disease.

### 3.2 Basic Decision-Making for Farmers in Choosing a Practical Marketing System

When making decisions, it is very necessary to consider things well and clearly. The basis for the decision-making of respondent farmers in Denpasar City in choosing a practical marketing system can be seen in Table 1.

Farmers choose to use a practical marketing system for various reasons. The lack of availability of labor, costs and time to harvest encourage farmers to choose this system. Cost is an obstacle in harvesting because farmers have to pay for labor costs, post-harvest costs, and the tools needed for harvesting. If farmers directly harvest and market independently, farmers need to provide a place for drying and storing the harvested grain. Farmers who have side jobs tend to lack time to carry out harvest activities, especially if the harvest season is close to religious ceremonies. With this system, farmers feel it is more practical, the process is shorter and the capital used for farming is returned more quickly through purchasing the harvest. According to SHI *et al.* (2021), This decision is quite appropriate considering that farmers in China prefer to use machines in farming, but it turns out that mechanization in the rice harvesting phase is inefficient, mechanization also becomes inefficient when applied to small-scale agricultural land. The same thing has also been reported by Hormozi *et al.* (2012) where harvesting rice using machines in Iran is equivalent to paying manual labor wages, and large investments are also required if farmers harvest their rice. Research conducted by Klein (2015) in America stated that the patterns they had learned came from sufficient experience in the decision-making process.

Table 1. The basis for farmers' decision making in choosing a slashing system

| No | Basis for Farmer Decision Making | Amount | |
|---|---|---|---|
| | | Yes (person) | No (person) |
| 1. | Intuition | 302 | 16 |
| 2. | Experience | 312 | 6 |
| 3. | Data | 178 | 140 |
| 4. | Research | 6 | 312 |
| 5. | Standard | 131 | 187 |
| 6. | Fact | 300 | 18 |
| 7. | Authority | 65 | 253 |
| 8. | Logic | 295 | 23 |

*Source*: Processed from Primary Data 2023

Prakris marketing system, farmers do not need to work more to market their crops. Farmers are only responsible until the rice is ready to harvest. The risk of crop failure or other problems after harvest will be minimized. As many as 55.97% of farmer respondents thought that data was one of the bases for making decisions. The data referred to in this research is data in the form of notes that the marketing system is practically good. Farmers who do not have a record of a good practical marketing system, only remember the estimated rice sales results in the drain and rainy season. This statement is supported by research conducted by Janssen *et al.* (2017) which reveals that an organization is harnessing the power of big data to improve its decision-making.

As many as 94.34% of farmer respondents stated that facts were one of the bases for decision-making. Research conducted by Harenčárová (2017) in Slovakia demonstrates that facts are the basis for decision-making by using their own experiences to inform decisions. Currently, most of the work as farmers is done by people in the elderly category, where this age category is not a productive age. Other facts about the relatively small capital and land area are also the driving reasons for choosing this system so that it is more profitable. Farmers find it practical; they are paid in cash after harvest and farmers don't need to bother carrying out marketing activities.

### 3.3 Practical Marketing System Viewed from The Buyer's Side

A practical marketing system is a practical system because farmers only need to care for the rice they plant until it is ready to harvest. Farmers also don't need to bother looking for workers or paying for freight and transportation costs to get to the planting site. Akite *et al.* 2022 also concluded that labor wages and access to markets are the biggest costs in the rice cultivation process in Uganda. Apart from that, remember that most farmers are elderly people who are no longer productive. Old farmers prefer to grow crops based on their habits, so there is less technological adaptation and innovation, apart from that, physical and health problems also limit the productivity of old farmers. On the other hand (P. Brown *et al.* 2019) stated that young farmers have the weakness of being less risk averse, more influenced by social norms, and less focused on finances. On the contrary, research carried out by (Pindado *et al.* 2018) concluded that age does not affect the technological adaptation and innovation of farmers in Europe. Kyire *et al.* (2023) stated that the intensity of implementing risk management instruments is influenced by the farmer's age, farming experience, land ownership system, access to extension, total agricultural land area, and erratic rainfall.

The rice farmers who were respondents were constrained by a limited area for drying rice. The necessities of life require farmers to get money as soon as possible from the rice they plant. Farmers also get capital loans from buyers, so that when the harvest arrives the farmer will get money from the buyer. The availability of labor for the harvesting process is quite limited so rice farmers are the respondents of this system. Farmers find it difficult to find workers because there are no funds available to find contract workers and laborers. Access to credit has a positive impact on the productivity of small farmers in developing countries, with gains of 15%. Acclassato Houensou *et al.* (2021) stated that Small managed to achieve a 13% increase in productivity in

Benin. Fauziana *et al.* (2023) add that other factors that also need to be considered are funds, human resources, and infrastructure.

The research results obtained data that the majority of rice farmers who were respondents, namely 38.68%, had used this system for 4 to 10 years. The relationship between farmers and buyers nowadays is increasingly difficult to separate. Abebe *et al.* (2016) found that farmers in Ethiopia can earn up to 225% higher gross profits if they sell their products without intermediaries. However, most farmers still trade through intermediaries because they guarantee minimum quantity and quality, and to reduce operational costs. Second, personalized relationships. Third, trade through intermediaries can increase the commercialization of smallholder farmers by connecting low-resource farmers with traders and final markets.

Several other aspects can describe the slashing system from the farmer's perspective which can be seen in Table 2. As many as 100% of respondent farmers stated that there were no local regulations regarding practical marketing systems. The absence of regulations regarding practical marketing systems applies both at the farmer, sub-district, and Denpasar City levels to the national level.

Table 2. Practical marketing system from the farmer's side

| No | Practical marketing system from the farmer's side | Farmers (person) | |
|---|---|---|---|
| | | Yes | No |
| 1 | There are local regulations regarding practical marketing systems | 0 | 318 |
| 2 | After the transaction (agreement) occurs, is there an obligation for the farmer to care for or manage it until the rice is harvested by the buyer | 310 | 8 |
| 3 | Choose practical marketing to avoid/minimize the risk of decreasing production quantity and quality | 83 | 235 |
| 4 | Practical marketing system makes it easier for farmers in the harvesting and marketing process | 207 | 111 |

*Source*: Processed from Primary Data 2023

As seen in Table 2, as many as 73.90% of respondent farmers chose this system to avoid or minimize risks. Approaching the harvest period, challenges in the form of pest and disease attacks have become common things faced by farmers. Grasshoppers, rats and grasshoppers, birds, crabs, snails, bedbugs, white butterflies, grasshoppers, stem borers, cut-neck disease, plant hoppers, wither wilt, and tungro virus are pests and diseases that usually attack the rice of respondent farmers. Islam *et al.* (2020) reported the results of a farmer survey in Bangladesh where farmers' limited knowledge regarding disease management caused significant crop yield losses. Akhtar *et al.* (2018) stated that most farmers in Punjab Province, Pakistan are inherently risk averse and view price, biological factors, and climate as potential sources of risk for their agricultural businesses. So are Mbah *et al.* (2023) stated that farmers in Cameroon tend to choose to avoid production risks, further explaining that gender, experience, and employment status also significantly influence decision-making in the agricultural sector.

### 3.4 Practical Marketing System Model in Rice Farming in Urban Areas

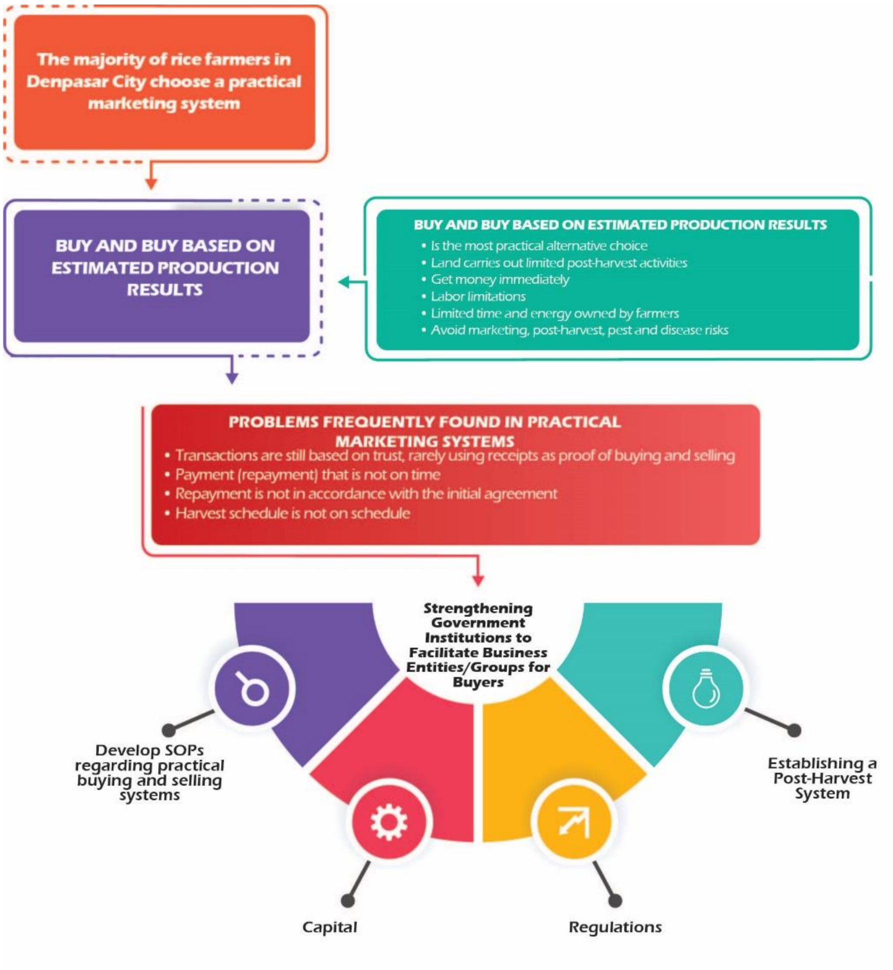
In a practical marketing system, farmers sell their rice by offering it to buyers directly. This is done because farmers have subscribed to buyers who usually buy in their respective areas. Munyimi & Chari (2018) revealed that in Zimbabwe, an important phenomenon related to buyer-seller relationships is that many procurement companies are developing single-source suppliers due to pressure to improve quality, reduce inventory, develop just-in-time systems, and reduce time to market. In general, farmers directly call or contact buyers who have become their customers. Kumarathunga *et al.* (2022) stated that the technological approach in marketing small-scale farmers' products in particular can increase farmers' financial profits because they can interact directly. Well-managed technology can also build trust between farmers and buyers and reduce risks associated with transactions, empowering unknown parties to transact. A study by Pikhart (2020) conducted in the Czech Republic shows that currently mobile devices are used in several multinational and small and medium-sized companies in business communications. Ajumobi & Kyobe (2017) add a language in South Africa that, by aligning human competencies, mobile phone technology, and the right business strategy, can lead its business to better performance.

The research results also found buyers looking directly to the production source to offer a practical marketing system. One of the factors that encourages buyers to look directly to production sources is that there is quite tight competition between buyers. Buyers need to confirm the price of rice directly to farmers by checking the quality and quantity of rice in the fields. By visiting farmers directly, the bargaining process will be easier. This is supported by research results by Mukoviz *et al.* (2022) carried out in Ukraine, which shows that at the same time, in the process of economic activity (buy/sell transactions), each agricultural producer incurs transaction costs that have a significant impact on the company's financial condition. Based on this, it is important to carry out field survey activities to determine the purchase/sale price.

Most of the transactions in this system are converted into money, but transactions are also found in the form of wet grain which will then be dried first, although in the end it is still converted into cash. Of all the buyers who were respondents, there were only two buyers whose transactions were in the form of dry grain because they had private RMUs. Estimates and determination of average prices are carried out 10 to 20 days before harvest when the rice starts to turn yellow. The reason buyers determine their estimates in this time range is because buyers need to see the condition of the rice in the field so they can estimate the production of the rice they want to buy. There is also another factor, namely competition that occurs between buyers so that the assessment can take precedence, some even up to 30 days before harvest.

In determining the purchase price, the buyer uses a calculation where the rice output is multiplied by the price of grain prevailing on the market, then this result is reduced by labor costs. The transaction price is determined by taking into account the land area and various costs incurred such as operational costs, labor costs, and maintenance costs. In the process of determining prices, bargaining or price negotiation occurs between buyers and farmers. Bargaining is carried out to reach an agreement on the nominal price of rice per land area.

Figure 1. Practical marketing system model in rice farming in urban areas




*Source*: Processed from Primary Data 2023

Based on research results, there have been conflicts between buyers and farmers. When the buyer has paid in full according to the agreed price and amount, the farmer declares a deficiency in the nominal amount of money handed over after the transaction is completed. Another conflict is when the farmer has paid the DP, but the rice that has been paid the DP is resold by the farmer to another buyer. Conflicts were also found between farmers and workers employed to harvest by buyers. Study (Nguyen *et al.* 2021) implemented in Vietnam showed that the majority of participants (36%) supported the deposit (DP/down payment) scheme. The DP system plays a very important role in buying and selling transaction activities to bind an agreement between the seller and the buyer.

This practical marketing system is a speculative decision considering the many risks faced by buyers. These profits and losses cannot be predicted considering that natural factors are the main factors determining the condition of rice. During the rainy season, the rice will collapse and the grain will become wet, which is a potential loss. Other risks include the presence of diseases such as viruses and pests such as planthoppers, mice, and birds which result in less dense rice.

## Conclusions

The practice of buying and selling rice using a practical marketing system in Denpasar City involves farmers as sellers and buyers who are usually called penebas. Starting the process from a practical marketing system, buyers play the role of interpreting prices and determining the harvest time of the rice they buy and farmers act as producers who sell their harvest (still on the tree) to buyers so that the distribution flow of the harvest can run practically. The reason why farmers choose a practical marketing system is that this system is considered more profitable for farmers with all the limitations of farming in urban areas, where farmers only need to care for the rice they plant until it is ready to harvest. Farmers do not need to look for workers, or pay for transport costs and transportation used to get to the planting site.

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## Credit Authorship Contribution Statement

**Gede Mekse Korri Arisena:** Project administration, Supervision, Writing–original draft;
**Dwi Putra Darmawan:** Conceptualization, Supervision, Validation;
**Ni Made Classia Sukendar:** Writing – review and editing, Data curation;
**Ni Luh Made Indah Murdyani Dewi:** Project administration, Funding Acquisition;
**Anak Agung Keswari Krisnandika:** Validation, Data curation, Writing – review and editing;
**Dina Lare Dunensa:** Writing – review and editing, Visualization;

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# Opinion about the Liquidity Preference Theory. Discussions Concerning Weight and Risk in the Townshend-Keynes Letters of November-December 1938

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**Abstract:** Townshend wrote Keynes a letter on November 25th,1938 and asked Keynes the following question, after informing Keynes that he had read Keynes's *A Treatise on Probability* a number of years earlier and understood Keynes's concept of non-numerical probability:

"*This is the nearest I can get to an analysis of the part played by the factor of confidence in the rationale of interest. I believe that its further logical analysis at a deeper level of generalization is connected with the part played by the weight of evidence in your theory of probability, but I cannot see just how*…." (Townshend 1979, 292; italics added).

Townshend 's question can be rewritten in the following fashion:

"Where, in your *A Treatise on Probability,* is your analysis of the connection between the variable, confidence, in the *General Theory* and the weight of evidence in your *A Treatise on Probability*, applied to support your analysis in the *General Theory* of your liquidity preference theory of the rate of interest?"

Keynes's response was direct and straightforward:

"As regards my remarks in my *General Theory*, have you taken account of what I say on page 240, as well as what I say at page 148, which is the passage I think you previously quoted…".(Letter to Townshend, Dec. 7th ,1938).

The answer given here by Keynes is for Townshend to read p.240 of the *General Theory*; however, it relates directly to Keynes's chapter 26 of the *A Treatise on Probability.*

What Keynes provides the reader of the *General Theory* on p.240 is his statement that there is *no discussion of how to estimate/calculate the risk and liquidity premiums in the General Theory.* This paper demonstrated that Keynes's discussion of how to estimate the risk and liquidity premiums occurs in chapter XXVI of the TP.

This paper demonstrates the logical and mathematical links between Keynes's *General Theory* liquidity preference theory of the rate of interest, where liquidity preference is defined as a function of uncertainty, U, and Keynes's *A Treatise on Probability* analysis of the evidential weight of the argument, V, which equals w, which is expressed in degrees. Keynes is pointing out to Townshend that U is a function of V, which is equal to w expressed in degrees. Thus, U is a function of w. We can write this out in English-

The evidential weight of the argument, V, is equal to the degree of the completeness of the amount of information on which the probability is based. Thus, Uncertainty is a function of the evidential weight of the argument, while liquidity preference is a function of uncertainty. The analysis that is missing in all past discussions by economists and philosophers of this issue has been their failure to identify the role played by Keynes's mathematical variable, w.

**Keywords:** evidential weight of the argument; weight; uncertainty; degree of completeness of the evidence; confidence; liquidity preference; rate of interest.

**JEL Classification:** B10; B12; B14; B16; B18; B22.

## Introduction

The paper will be organized in the following way. Section One will cover the connections between chapter VI of the *A Treatise on Probability (TP,1921),* which involves Keynes's definition and application of his second logical relation, V, which is called the 'evidential weight of the argument", and chapter XXVI, which contains Keynes's measurement of V, as well as the mathematical development that is required to fulfill Keynes's promise, made on p.75 of chapter 6 of the *TP*, to integrate both probability and weight into a combined approach to dealing with expectations about the future.

Section Two will demonstrate that Keynes is referring Townshend to chapter XXVI of the TP, where Keynes completed his analysis of evidential weight that he began in chapter VI.

Section Three will look at some examples of Post Keynesian and heterodox economists trying to deal with chapter XXVI, who lack an understanding of the mathematical and theoretical nature of Keynes 's exposition that resulted in the creation of the first decision weight approach to expectations in history, Keynes's c coefficient.

Section Four discusses how Keynes's liquidity preference theory of the rate of interest, which is based on his non numerical probability, weight concept and c coefficient, underlies the logical foundations of Keynes's LM equation specification on page 199 of the *General Theory*.

The conclusion of the paper ends the paper by emphasizing that, if a reader does not correctly understand how Keynes measures V in chapter XXVI of the TP, then it will be nearly impossible for that reader to fully grasp Keynes's liquidity preference theory of the rate of interest in the General Theory. Keynes does make it clear in his letter of Dec.7th, 1938 to Townshend that he did discuss the estimation of both liquidity and risk premiums in his TP:

"I am rather inclined to associate risk premium with probability strictly speaking, and liquidity premium with what in my Treatise on Probability I called 'weight'" (Townshend 1979; Keynes, letter to Townshend, Dec. 7th, 1938, Vol. 29, CWJMK, p.293).

The only place this occurs in Keynes's published work is on p.315 of the TP. Keynes has set the stage for Townshend. Townshend knew, based on his having read the TP, that there were only two chapters in the TP that examine weight, by which Keynes means the evidential weight of the argument. Chapter 6 provides the logical foundation; chapter 26 provides the mathematical foundation. Keynes's emphasis on display here, on logic first and mathematics second, follows directly from G Boole.

Keynes thus supplemented his footnote 1 on page 148, which mentions chapter 6 of the A Treatise on Probability, while simultaneously emphasizing page 240 of the *General Theory*. Only one possibility was left for Hugh Townshend to consider -it is chapter 26 of the TP which contains Keynes's discussion about how to estimate/calculate both the risk (probability) and liquidity (weight) premiums. Keynes's discussion and analysis is contained on pp. 310-315 of chapter 26, where weight is analyzed in the context of Keynes's development of his conventional coefficient of weight and risk, c, which incorporated both weight and risk into a decision theoretic approach dealing with probability(risk) and confidence (weight), which together form a decision maker's expectations of the future.

An example of the failure to grasp Keynes's chapter XXVI analysis occurs in Weatherson (2002) which is confusing, as Weatherson (2002) never covered Keynes's interval valued approach to imprecise probability, covered in Part II of the TP or Keynes's measurement of V by w in chapter XXVI. Weatherson (2002) covers only chapter III and chapter VI of the TP. The conclusion of this paper, that Keynes's theoretical exposition could be greatly improved upon by reinterpreting it as a very early, unclear attempt on Keynes's part to deal with imprecise probability, fails because Weatherson (2002) never realized that Keynes had a fully developed, imprecise probability in Parts II and III of the TP, in 1921. Weatherson (2002) is thus a good example of the main conjecture in Hishiyama (1969), which was that the major problem in Keynes studies and scholarship was the failure to have read the TP.

## 1. Literature Review: Chapters VI and XXVI of the A Treatise on Probability as Analyzed by Academicians

Chapter 6 lays out the nature of Keynes's second logical relation, V, where V stands for V(a/h), where, as in Keynes's discussions in chapter 2 on pp. 4-6 and later chapters, h stands for the propositions (premises) that contain the relevant evidence and a stand for the conclusion(s) that are related to the h propositions. Apparently, no academician in the 20th or 21$^{st}$ centuries actually read pp.4-6 of chapter II of the TP, given the currently unanimous conclusion that Keynes capitulated to Ramsey, either wholly or in part, in 1931. (See Clarke 2023, Gerrard 2023a, and Misak 2020 for a few examples). Reading pp.4-6 of the TP is the antidote for Braithwaite (1973). It was in Keynes (1973) that a catastrophic miscalculation took place. An editorial foreword, placed at the front of the CWJMK edition of the TP in Keynes (1973), has misled thousands of readers since 1973. It is quite impossible to read pp.4-6 of the TP and simultaneously accept that Keynes made major errors in Part II of the TP.

There are two major errors that recur repeatedly in the 100-year literature on Keynes's Evidential Weight of the Argument. The four reviews of the TP, published in 1922 by Edgeworth, Russell, and Broad, all covered weight and none of them mention any errors. Unfortunately, these reviews have not been read carefully or in any great detail by philosophers and economists.

The first error is the claim that Keynes measured weight in chapter VI, which is an impossibility as no logical relation can be measured until it has been normalized on the unit interval and interpreted as a degree.

The second error is the claim that Keynes never followed through on his discussion on page 76 of the TP in chapter VI about the problem of incorporating weight technically, along with probability, into a representation of expectations as it relates to the application of probability to conduct.

Consider the summary made by Levi (2011) of his position in 2011:

"…although Keynes reiterated this thought ("… to take into account the weight as well as the probability of different expectations." (Keynes 1921, 76). Later on in his Treatise, he did not propose anything more than a sketch of a positive account of his own weight of argument or how it bore on decision making or inquiry." (Braithwaite 1973, 48).

This is simply false. Keynes provides a detailed analysis from page 310 to page 315 leading up to his mathematical analysis on p.315 of the *TP* that accomplished precisely and exactly what Keynes said he would do on page 76-integrate weight and probability into a formal, mathematical analysis of expectation formation.

In chapter VI, Keynes makes it very clear that he is not discussing the measurement of V other than to make comparisons involving different V relations:

"The weight, *to speak metaphorically*, measures the *sum* (Keynes's italics) of the favorable and unfavorable evidence, the probability measures the *difference* (Keynes's italics)." (Keynes 1921, 77).

Every single economist and philosopher, who has written on Keynes's evidential weight of the argument, has simply ignored Keynes's qualification about "to speak metaphorically." The erroneous belief among philosophers, that Keynes is specifying measurement of V in chapter VI, for example, is presented in Keynes, J. M. (1921), Levi (2011), Weatherson (2002), Peden (2018), Joyce (2005), Kasser (2016).

Among economists, the major error had been made by Keynes (1921). Vercelli attempted to correct Keynes (1921), but failed (See Vercelli 2011, 2013, 2016, 2018).

Where, then, does Keynes's definition of the measure of 'weight' (evidential weight of the argument) appear in his TP? The answer is specifically given by Keynes on p.315 of the TP. [The importance of w was explicitly discussed in Brady (2004a, 2004b, 2023)]:

"…where *w* measures the 'weight'…" (Keynes 1921, 315).

Therefore $V=V(a/h)=w$, where $0\leq w\leq 1$, so that the evidential weight of the argument must come in degrees. Therefore, the claim that Keynes's weight is monotonically increasing is an oxymoron, given that $0\leq w\leq 1$.It is mathematically and logically impossible for weight to be monotonically increasing for Keynes. The monotonicity conclusion follows by mistakenly treating V as a mathematical variable instead of as a logical symbol.

There can only be ONE, AND ONLY ONE, way to measure Keynes's weight and that is by using Keynes's own definition on p.315. Runde's severely erroneous reading, in which he claims that Keynes gave three different conflicting and contradictory, multiple definitions/meanings of weight, each with their own distinct measure, of Keynes's chapter VI, is very similar to Ramsey's imagined claims, based on his own definitions about how the a and h propositions were related in Keynes's logical theory of probability, which Ramsey claimed were similar to Moore's Platonic entities. Ramsey's definitions directly conflict with, and are contradicted by, Keynes's explicit and clearly defined analysis of the meaning of the a and h propositions on pp.4-6 of the TP, which follow directly from Boole's analysis and have nothing to do with Plato, who is never mentioned anywhere in Keynes's TP or General Theory.

Keynes defined w to be on the unit interval [0,1], $0\leq w\leq 1$, so that it must come in degrees. This makes it impossible for weight to be monotonically increasing if it is defined on the unit interval as a degree. Yet this is exactly what is asserted by all philosophers who have done work on Keynes's weight relation. What does w mean? Keynes had already stated that w measures

"…the degree of the completeness of the relevant information …" (Keynes 1921, 313).

w needs to be incorporated in the calculations of expectations. w is the degree of the completeness of the relevant information. It is a mathematical variable. V is a logical symbol. V has been conflated with w. This error has made it impossible to formally deal with Keynes's liquidity preference theory of interest.

## 2. Method

Examining (Townshend 1979) to specify where in Keynes's *A Treatise on Probability* Keynes provides an analysis of weight that supports his *General Theory* concept of confidence. The answers provided by Keynes appear in his letter of 7th of December,1938.

We are now in a position to show how Keynes answered Townshend's question to him, which was

"This is the nearest I can get to an analysis of the part played by the factor of confidence in the rationale of interest. *I believe that its further logical analysis at a deeper level of generalization is connected with the part played by the weight of evidence in your theory of probability, but I cannot see just how*…." (Townshend 1979, 292; italics added).

Given that Keynes clearly and unambiguously defined V=V(a/h)=w appears on page 315 of (Keynes 1921) where 0≤w≤1,it was easy and simple for Keynes to answer Townshend's question ,as well as to fill in the relationships between the evidential weight of the evidence, V, confidence, liquidity preference and uncertainty that exist in the GT .We will let C=confidence, LP =liquidity preference, and U=uncertainty.

In footnote 1 on p.148 of Keynes (1936), Keynes defines uncertainty as a function of weight, V. Therefore, one gets U=f(V). However, Keynes on p.315 of the TP defines V=V(a/h)=w. Therefore, so U=g(w). It directly follows from this that C=h(w) and LP =j(w). Finally, Keynes's discussions of uncertainty, confidence, and liquidity preference are all expressed by Keynes *as being in terms of degrees*. This follows directly from page 315 in chapter 26 of the TP, where w was defined in terms of degrees.

Keynes's analysis in (Townshend 1979) directly conflicts with the Joan Robinson, G L S Shackle, Robert Skidelsky and Paul Davidson claims about something called fundamental uncertainty, which is a binary(dual) representation of uncertainty-unknowledge and certainty-knowledge that does not appear in any of Keynes's writings. No degrees of uncertainty are allowed, as it is impossible for Keynes's w to be accounted for by Robinson, Shackle, Skidelsky or Davidson in their ideas about fundamental uncertainty, which is excluded from Keynes's three decision categories of risk, uncertainty and ignorance.

It also calls into question any claims made by Post Keynesian, Institutionalist, and heterodox economists about alleged connections that have been claimed to exist between Keynes's work and their work on liquidity preference and the liquidity preference theory of the rate of interest, since none of their work integrates Keynes's mathematical measure of V, given by w.

## 3. Research Results

The grave error of overlooking Keynes's decision weight version of his interval valued approach to probability in chapter XXVI of the TP-The cases of Runde (1990, 1994); Baddeley (1999), Basili and Zappia (2009).

The errors in Runde (1990) follow directly from Runde's decision to simply ignore Keynes's analysis on p.315 of the TP, as it directly contradicts the analysis in Runde (1990, 1994).

Consider the following:

"Nevertheless, an unambiguous statement on the role of weight appears in Chapter 26(XXVI) of the Treatise, on" The Application of Probability to Conduct." …I now turn to the role of uncertainty and weight in Chapter 12 of the General Theory." (Runde 1990, 285).

There is no ambiguity in Keynes's statements about weight. Nowhere in Runde (1990, 1994) is there the slightest understanding that Keynes stated that the weight, V, is measured by w or of its seminal importance in the history of decision theory, since Keynes's c coefficient is the first such attempt in history.

First, I will examine (Runde 1994):

"It is true that he does, in an offhand passage, propose a 'conventional coefficient' of weight and risk. But this is only to set up his conclusion that the DME is unlikely to be saved by attempts to find 'some more complicated function of the probability wherewith to compound the proposed good (VIII, p.148)." (Runde 1994, 115).

Unfortunately, Runde is totally and completely oblivious to the fact that Keynes, in this so called offhand passage , is unequivocal in defining that…' weight' is measured by w…" (Runde 1990, 315).This is the only place in the TP where Keynes measures weight .The claims in Runde 1990 about Keynes having given three conflicting and different definitions concerning the measurement of weight makes it impossible for a reader to understand Keynes's analysis. Runde completely conflates and confuses two completely different questions here, which are (a) the theoretical specification of a model to explain a particular phenomenon versus the second question (b), which concerns the appropriate role for the actual application of such a theoretical model in the real world.

Given that Keynes's V, weight, is measured by w, then significant parts of Runde 1990 are erroneous and need to be either revised, rewritten, corrected or withdrawn from the journal, *Economics and Philosophy*. See Runde 1990.

Second, I will examine Baddeley's erroneous assessments of Keynes c coefficient. Consider the following claim made by Baddeley (1999). Baddeley (1999) makes the following claim:

"His (Keynes's) derivation of this coefficient (author's note -the conventional coefficient of weight and risk, c) seems anomalous given his emphasis on the limits to quantifying probability and weight." (Baddeley 1999, 203).

Of course, Baddeley (1999) is confused here. Keynes's emphasis was on the limits of exact and precise numerical quantification. Keynes, however, was an advocate of imprecise and inexact approximation regarding measurement. The c coefficient analysis follows directly from Keynes's analysis in chapter VI of the TP, which has been overlooked for 100 plus years:

"The conclusion, that the 'weight' and the 'probability' of an argument are independent properties, may possibly introduce a difficulty into the discussion of the application of probability to practice.∗ For in deciding on a course of action, it seems plausible to suppose that we ought to take account of the weight as well as the probability of different expectations. But it is difficult to think of any clear example of this, and I do not feel sure that the theory of 'evidential weight' has much practical significance." (Keynes 1921, 76).

The * footnote is explicit. It says:

Keynes is explicit that it is in chapter XXVI that he will discuss "…. A difficulty … of the application of probability to practice. ∗" (Keynes 1921, 76). Of course, Keynes eventually

"∗See also Chapter XXVI. § 7" (Keynes 1921, 76).

was able to construct a" … clear example of this." Keynes's example was called liquidity preference by Keynes in the case of decision making under uncertainty and absolute liquidity preference in the case of decision making under ignorance.

Lastly, I will examine Basili and Zappia (2009). Basili and Zappia (2009) can be regarded as an example of what happens over time in academia when a severe errors appears in a journal article, in this case (Runde 1990), and the errors are not corrected. The error then starts to spread like a virus exponentially throughout the academic community.

Consider the following extensive, but erroneous, discussions of Basili and Zappia (2009):

"Keynes's definition of weight was not accurate enough to be interpreted unambiguously. As reported in the above statement regarding the balance between amounts of "relevant knowledge" and "relevant ignorance," he hinted at a way to calculate the weight, but the point was not taken further. And when he used the weight in discussing decision criteria for choice, Keynes (1973, p. 345-Page 345 is actually from the 1973 edition of the TP) admitted that he considered the significance of the weight "highly perplexing;" additionally, he gave a slightly different definition of it by arguing that the weight of an argument is "the degree of completeness of the information upon which a probability is based."

There is a substantial literature about the Keynesian notion of weight of argument. Possibly because of Keynes's inability to adhere to a precise definition, the weight has been given different readings… Apart from Keynes's explicit claim that probability and weight are independent properties, the latter seems to refer to something different from the absolute amount of knowledge on which the probability assessment is based, as even the admittedly scant references to it in his major economic works suggest. Runde (1990) was probably the first commentator to call attention to the fact that there are different definitions of weight in the Treatise. Runde emphasized the importance of the definition of evidential weight as the degree of completeness of information on which a probability assessment is based, rather than the mere absolute amount of evidence implicit in the second order probability interpretation. In Keynes's approach, that is, new evidence can increase the relevant ignorance more than the relevant knowledge, thus decreasing the weight of argument." (Basili and Zappia 2009).

Contrary to Basili and Zappia (2009), Keynes gave an exact and precise definition of weight. That definition, that $V(a/h)=w, 0\leq w\leq 1$, appears on p.315 of the TP. Their footnote 13 simply ignores Keynes's definition and reduplicates all of the erroneous conclusions about the measurement of V made in (Runde 1990), 20 years before the publication of Basili and Zappia (2009):

"[13] Runde (1990) has proposed the following notation for the different notions of weight (V) of a certain proposition (a) given the available evidence (h), in terms of knowledge (K) and ignorance (I): absolute amount of relevant knowledge: V(a/h) = K; balance of absolute amounts of relevant knowledge and ignorance: V(a/h) = K/I; and degree of completeness of information: V(a/h) = K/(K + I). As Keynes (1921, p. 348 [author's note -this pagination is from the 1973 CWJMK edition of the TP, not the 1921 edition, which is on p.315] stated that the weight can be measured by means of the closed interval between 0 and 1, assuming K + I = 1 only the third definition of weight seems accurate." (Basili and Zappia 2009, 424).

Incredibly, Basili and Zappia are referring to the fact that Keynes stated that

"…'weight' is measured by w"…by means of the closed interval between 0 and 1."

Strangely, Basili and Zappia 2009 do not notice that if Keynes measured weight by w, then this invalidates all of their discussions of Runde (1990) on weight.

Vercelli (2011, 2013, 2016, 2018) tried to correct for the failure of Runde (1990) to incorporate normalization in his discussions in Runde (1990). However, Vercelli's normalization, that 0≤V≤1, can't apply to a logical relation (See Townshend 1979, Vercelli 2011, 2013, 2016, 2018). So, it is quite impossible for V(a/h) =K/(K+I). What is missing here is Keynes's mathematical variable, w:

V=V(a/h) =w, where w = K/(K+I) and 0≤w≤1,

provided the correct analysis. It is impossible to have 0≤V≤1.

The wrong normalization made by Vercelli 2011 appears in Terra (2023), *The Economics of John Maynard Keynes*. (Terra 2023, 5-9). Terra follows Vercelli (2011) word for word.

It must be pointed out that Vercelli did spot the errors in Runde 1990. Vercelli did correctly attempt to correct for Runde's failure to incorporate the required normalization in his discussion of V in Runde 1990, 1994. Unfortunately, Vercelli's attempted correction does not work. Vercelli's contribution is the normalization of the logical relation, V, which results in the mathematical impossibility that 0≤V≤1 (See Vercelli in Townshend 1979, Vercelli 2011, 2013, 2016, 2018). It is quite impossible for the logical relation V(a/h) in chapter VI of the TP to equal the mathematical equation K/(K+I) until the normalization on the unit interval occurs on p.315 by setting K +I=1.

The only way to proceed is to follow Keynes in (Keynes 1921, 315):

V=V(a/h) =w,0≤w≤1, where w=K/(K+I).

## 4. Discussion

The relation between Keynes's LM curve, his liquidity preference theory of the rate of interest, and the TP, as discussed by Townshend in 1938.

Given Keynes's discussions of p.240 of the GT with Townshend, the Liquidity Preference theory of the rate of interest, where the rate of interest, i, is a function of expectations (indeterminate, non-numerical, interval probability [$p_1$, $p_2$], where $p_1$ is the lower bound and $p_2$ is the upper bound) and uncertainty, which is a function of V(a/h) =w.

Keynes's LM curve is a function of i and Y, where Y equals Nominal Income, defined by Keynes as PO, where O is real output and P is the actual price level.

We are now in a position to consider Townsend's question, which was

"This is the nearest I can get to an analysis of the part played by the factor of confidence in the rationale of interest. I believe that its further logical analysis at a deeper level of generalization is connected with the part played by the weight of evidence in your theory of probability, but I cannot see just how…." (Townshend 1979, 292).

So as to be able i to analyze Keynes's answer.

We quoted the question of Townshend 1979 to Keynes in 1938 at the very beginning of this paper. Townshend (1979) is asking Keynes to explain to him how he was able to connect the question of confidence in Keynes's GT to the discussion of weight of evidence and non-numerical probabilities, as contained in Keynes's *A Treatise on Probability*.

Keynes's definition of LM appears on page 199 of the GT. It was that LM=f (i, Y).We can now use Keynes's answer to Townshend to discuss the foundation for this function that can be found in the *A Treatise on Probability*. LM =f (i, Y), where i =g(expectations, confidence)=h([p1,p2],w) would link Keynes's chapters XV and XXVI of (Keynes 1921) to chapters 15 and 21 of (Keynes 1936, 199, 298-299),where Keynes discusses both the IS and the LM equations.

However, Keynes made it clear in his answer to Townshend in his letter of Dec.7th, 1938, that he discussed the estimation of both the liquidity and risk premiums in his A *Treatise on Probability.* Keynes's answer to Townshend is repeated below:

"*I am rather inclined to associate risk premium with probability strictly speaking, and liquidity premium with what in my Treatise on Probability I called 'weight'"* (Runde 1994, 293, italics added).

There is only ONE place where this was done by Keynes during his lifetime. It is in chapter XXVI of the TP, where Keynes put forth his conventional coefficient of weight and risk, c (Keynes 1921, 315; Keynes 1973, 348).

c is a function of p, probability, and w, weight,

so c= (p, w), which, as Keynes made clear in his definition of c, explicitly dealt with both risk and weight .

We can then rewrite LM =f (i, Y),where i=g(expectations, confidence)=h(p, w )=j(c ).It is much simpler and straightforward to make use of c then use the difficult to grasp interval valued approach of Keynes ,which Keynes referred to as non-numerical probabilities .No economist or philosopher in either the 20th or 21st centuries was ever able to realize that an interval valued probability was called by Keynes a non-numerical probability.

Keynes then combines his LM curve with his IS curve on pp.298-299 in Keynes 1936, where he presents his whole IS-LM model. Keynes described his model on pp.298-299 in Keynes 1936, using the following words and phrases:

- Keynes states that one can calculate a quantitative answer with the model's three elements
- Keynes states that the model is composed of three elements a), b), and c), which are the Liquidity Preference function, the m. e .c. schedule, and the consumption function-investment multiplier. All three elements together determine the rate of interest.
- Keynes states that it provides an analysis that is valuable in introducing order and method to the enquiry
- Keynes states that the analysis is based on a set of simultaneous, mathematical equations
- Keynes states that these equations provide a determinate answer or result
- Keynes states that this answer or result is an equilibrium position
- Keynes states on pp.300-303 that his model does *not explicitly* include five other, important factors, which must be taken into account by any user of his model
- Keynes mathematically integrates LM into the AD(D)-AS(Z) model of chapter 20 on pp.304-306 in section 6 of chapter 21 of Keynes 1936.

Keynes had thus clearly discussed his model's shortcomings on pp.300-303 before he mathematically integrated his LM equation into his D-Z model of chapter 20 on pp.304-306 of chapter 21 (Keynes 1936).

The Townshend-Keynes exchanges thus provide the evidence to support the conjecture of Hishiyama (1969) that there was a close connection existing between Keynes's TP analysis and his GT analysis.

## Conclusion

Keynes carefully discussed V as a logical relation in Chapter 6 of the TP. Keynes uses the words "The measurement of evidential weight presents similar difficulties" (Keynes 1921, 71). However, he merely discusses the strengths of the two logical arguments, given two different, logical V relations, for instance, $V(a/hh_1)>V(a/h)$. This is a very weak form of comparison of the logical strengths of each of the arguments (Keynes 1921, 73). It is on p.77 that Keynes makes it clear that he has NOT defined or measured what the V's are equal to .Once Keynes defines that $V=w, 0\leq w\leq 1$,then one can say that, given that $V_1 = w_1$ and that $V_2 = w_2$,that either $w_1>w_2$ or the reverse is the case. Suppose $V(a/h\ h_1)=w_1$ and $V(a/h)=w_2$.Then $w_1>w_2$ since it has a greater amount of absolute knowledge and less absolute ignorance, given the normalization of w on [0,1].

Keynes's position is clearly presented below:

"The fundamental distinction of this chapter may be briefly repeated. One argument has more weight than another if it is based upon a greater amount of relevant evidence, but it is not always, or even generally, possible to say of two sets of propositions that one set embodies more evidence than the other. It has a greater probability than another *if the balance in its favour, of what evidence there is, is greater than the balance in favour of the argument with which we compare it; but it is not always, or even generally, possible to say that the balance in the one case is greater than the balance in the other. The weight, to speak metaphorically, measures the sum of the favourable and unfavourable evidence, the probability measures the difference."* (Keynes 1921, 77); italics added).

At this point, it is simply impossible to incorporate both probability and weight into a decision rule, since only the logical relation of probability has been defined mathematically as

$P(a/h) = \alpha, 0 \leq \alpha \leq 1$, where $\alpha = p / (p + q)$.

Only after chapter XXVI of Keynes (1921) is reached do we have the logical relation of weight defined mathematically as

$V(a/h) = w$, $0 \leq w \leq 1$, where $w = K/K+I$).

Only then can both risk (probability) and weight (confidence) be integrated together in Keynes's c coefficient, where

$c = p[1/(1+q)]\ [2w/(1+w)]$.

This is then multiplied by A, an outcome or U(A), the utility of the outcome, to obtain

cA or cU(A).

cA is to be used by a decision maker instead of pA, where pA is the exact or strict mathematical expectation that does *not* integrate either risk or weight considerations into the decision-making calculus.

Until this basic, fundamental, logical and mathematical foundation is understood and recognized by economists, as well as by the philosophers who rely only on F P Ramsey's mathematical expectations approach, no progress will ever be made by them regarding the connections between Keynes's Liquidity Preference theory of the rate of interest, the TP and GT. See Brady (2023) for a reassessment of Keynes's V relation and the role played by it in Keynes's approach to decision making in Keynes (1936) as well as Arthmar and Brady 2018.

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## Declaration of Competing Interest

The author declares that he has no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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# Performance Management in the Public Sector of Albania

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**Abstract:** *In the realities of today's economy, the development of good governance in the public sector is one of the most important tasks of the authorities. If actions on the part of the authorities are not conducive enough, it can cause a multitude of negative consequences for the country's economy and the living standards of its citizens, as well as for the country. Therefore, an assessment of governance by the authorities in different countries around the world is a relevant research topic. The analysis is carried out for Albania in Vlora. The research aims to show how effective public administration is in the public sector in the country now. The main methods used in the study were analysis, forecasting, abstraction, and the historical method. The study included a contemporary assessment of the state of efficiency governance in Albania. It was shown that there are problems in this area due to the socialist past of the country. In addition, difficulties with the corruption component remain relevant, which requires urgent action and finding new methods to counter it. The work also assessed the current state of the Vlora region. It was shown that despite the serious difficulties associated with the outbreak of the COVID-19 crisis, the region is developing quite strongly. The reason for this is, among others, the policy formulated by the public authorities, which aimed to support local producers and medium and small enterprises, as well as to create policies to promote domestic tourism. This paper brings new insights into the field of public sector management, as well as a better understanding of the functioning of the Albanian economy.*

**Keywords**: management; macroeconomics; regional development; tourism; COVID-19.

**JEL Classification:** H00; H11; Z30; R11.

## Introduction

Public sector performance management plays a key role in developing a country, providing quality services, and meeting the needs of citizens (Helden, Reichard 2013; Ammons 2022). As a key building block in every country, the public sector is responsible for implementing policies, delivering public services, and managing public resources. The well-being of a country depends on the quality of government representatives in exercising their powers. In economic theory, the role of the state became more pronounced after the Great Depression and John Maynard Keynes's General Theory of Employment, Interest and Money (Keynes 1936). At that time, a large part of the economic community concluded that the state should not just remain a bystander to economic processes, but should actively participate in them, at least in times of crisis, when businesses and households needed its support by stimulating demand (Pal 2022). With the subsequent increase in the understanding of the role of the state in ensuring the well-being of citizens, the authorities have started to intervene more and more in economic processes. Although such active intervention can lead to positive results, such an outcome is not mandatory (Sadeh, Radu, Feniser, Borsa 2021; Wang 2018). In other words, such state action can both improve the quality of ongoing economic processes and worsen them. This depends primarily on how effectively such interventions have been organised and planned (Chimhowu, Hulme, Munro 2019; Hudson, Hunter, Peckham 2018). Thus, exploring opportunities to improve management processes in the public sector is still relevant. In this study, the evaluation is conducted for Albania, specifically within its individual Vlora region.

The effectiveness of public sector governance in Albania has been assessed by many scholars. For example, G. Husi (2015), analysing the performance of the authorities, concludes that Albania has not fulfilled its commitment to establish an effective and accountable public administration, which harms the quality of life of its citizens. At the same time, O. Milova and A. Llozana (2022) concluded that the governance situation in the sector is gradually improving, including through changes in the legal environment. A study on the efficiency of public services in Albania was carried out by I. Tomorri, R. Keco, and G. Mehmeti (2020). The researchers conducted a study that showed that the local population in Albania generally sees a positive trend in terms of developments in the efficiency of public sector governance. In addition, citizens expect the situation to improve thereafter, particularly in the areas of public services, infrastructure improvement, investment management, etc. A study on the formation of opportunities to improve the efficiency of public administration in the country through changes in legislation was conducted by K. Vuksanlekaj (2019). The scholar shows that the state authorities should pay attention to the fact that in the past the country was one of the Eastern European satellite states of the Soviet Union of Socialist Republics, which forms some peculiarities both in the principles of its functioning and governance. It is therefore important to consider the historical, political, and economic context of the country's development.

The research aims to assess the effectiveness of public administration in Albania, analyse inherent trends in the country and draw conclusions about how the situation might develop in the future. This will allow for more effective policymaking around management of the activities of the authorities.

## 1. Materials and Methods

Before starting the study, a hypothesis was put forward that had to be proven in the research. It goes as follows:

$H_1$ Performance management in Albania's public sector is reasonably efficient.

The research results will assess the effectiveness of governance in the public sector in Albania, based on existing indicators, to assess the level of transparency, accountability, and efficiency of public authorities. If the amount of evidence found confirms the effectiveness of governance, hypothesis $H_1$ will be considered confirmed. However, if the research does not find enough of them, the hypothesis will be considered not proven. In this case, additional research and analysis may be needed to better understand the situation and to identify the reasons that impede the achievement of good governance in the public sector in Albania. The findings on the situation in terms of assessing the effectiveness of public sector governance in Albania will allow informed decision-making and the development of strategies to improve governance and fight corruption in the public sector of Albania.

Studying has several limitations. First, quantitative data was not used to conclude the assessment of governance effectiveness due to its unavailability in the public domain. This also suggests that the performance of state representatives in the country is poor, as openness of data is one of the main characteristics for building citizens' trust in them. Secondly, the study focuses on the state of governance effectiveness in Vlora but takes little account of where governance is found in other regions, which may distort the conclusions for the country.

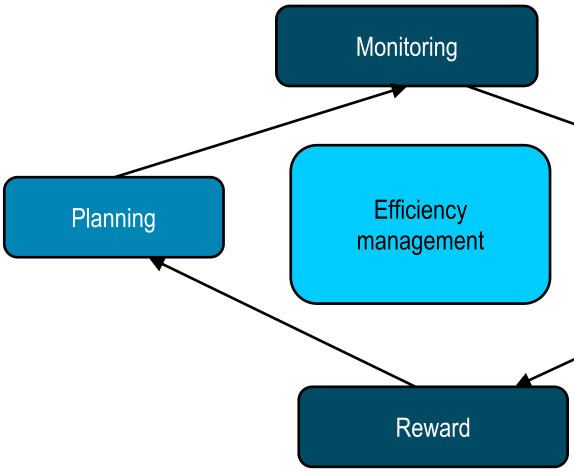
The main approach used in the research was systematic. It allowed to consider all factors affecting public administration in Albania and to assess them as interrelated processes that form a single system of interaction, thereby allowing to better understand the characteristics of the current state of this component in the country. During the study, many different scientific methods were also used. One of the main ones was analysis, which allowed to review the selected information and draw important conclusions for the work on its basis. The historical method allowed to evaluate the effectiveness of governance in Albania in retrospect and to understand the reasons for its current state. Forecasting was also used, making it possible to assess how the level of efficiency in Albania's public sector might develop in the future. Abstraction played an important role, allowing attention to be disregarded for factors that do not have a significant impact on efficiency management in the public sector. The deduction was also used to identify the main factors affecting public sector performance management in Albania, based on the overall state of the sector in the country. Modelling was also used to construct a general theoretical model of performance management itself, which describes the steps of the process and how it should take place, enabling a better understanding and appreciation of the characteristics of the performance management process in the public sector.

## 2. Results

During the last decades (with the development of innovative technologies and the Internet), governments faced various challenges, including rising citizen expectations, the need to cope with budgetary constraints and the requirement for increased transparency and accountability. In response to these challenges, many countries have begun to develop and implement public sector performance management strategies. Their basic principles include strategic planning, monitoring and evaluation of results, risk management, transparency, and citizen participation in decision-making. Achieving efficiency also requires the introduction of innovative methods and the use of technology that help improve services and simplify interaction with citizens. In the future, such a planning system must evolve and adapt to a progressively changing environment. This includes improving management systems, applying analytical tools for informed decision-making, and actively using data for continuous process improvement.

Performance management is defined as a wide range of policies, strategies and methods aimed at guiding leaders, managers, and employees towards achieving results and improving the organisation's effectiveness in delivering results (Wakula 2021). The development of such strategies can take place at different scales, from the regional to the national level. Nevertheless, its essence remains the same. A common model for performance management is shown in Figure 1 below:

Figure 1. Efficiency management model




*Source*: compiled by the author

As can be seen from Figure 1, performance management is a cyclical process consisting of four stages that flow into each other. During planning, key objectives are set and metrics are defined to measure the actual performance of the processes. The next stage is monitoring, which regularly assesses progress and possible obstacles that may arise during the implementation of certain actions. The review phase assesses the finished result, from which conclusions are drawn as to how effective the project has been. The last step is the provision of remuneration to the participants in the process, which may vary depending on how well the project was implemented (work done, plan implemented, etc.) There may be no remuneration at all if the implementation has failed or is not as effective as originally planned in the planning stage. However, it is worth noting that in the public sector, there are a significant number of specific features relating to performance management. For example, the large number of objectives and interests to be achieved by the public sector, the complexity of the political and organisational structures, certain particularities in performance measurement and others. This makes the process of performance management more difficult for government agencies, because of which it requires special skills and abilities.

The Albanian state authorities have been trying for years to establish an administration that can carry out its mandate effectively. However, short-term gains and corruption on the part of government officials made public administration rather weak, with limited capacity and a lack of transparency. The reasons for this level of governance in the country may lie in its past: given the pre-1990s planned system (which had proved to be largely ineffective in terms of governance), Albania needed a transition to new principles of government. This process has been difficult for the country, with a variety of difficulties, both social and economic. High unemployment, still at a relatively high level of 11.82%, has been a major problem (Macrotrends 2023). Due to the existing difficulties in the transition to the new system of government organisation, the country has failed to achieve impressive results in terms of the efficiency of the public sector. Another important challenge in terms of performance management is the process of appointing responsible managers to their positions. This is because it is often politically motivated. This practice was widespread in the Soviet Union of Socialist Republics (USSR) and was inherited by most of its member states, including Albania, which was one of its Eastern European satellite states. Although the situation is now beginning to improve gradually, it is too early to talk about significant progress in this area.

One important ingredient for ensuring improved quality in performance management is the use of state-of-the-art technology. This determines several advantages. For example, process automation and optimisation enable routine tasks to be automated, speeding up and optimising the work of public services: e-document management systems can reduce the time it takes to process and transmit information. All of this improves the accessibility and usability of public services, improves the transparency of data and internal processes at public institutions, enhances cyber security and reduces costs in general. In other words, digitalization in the public sector contributes to an efficient and open governance system that meets the needs of citizens, improves the quality of services provided and contributes to economic development. Given all the above-mentioned effects of digitalization on public sector processes, it can be understood that its application will also be effective in countering corruption. Transparency in public sector processes makes it much more difficult for any activity to exceed the authority of any given public official. Therefore, the use of the latest technology in management is very relevant in Albania at the present stage, including in its regions.

While the country does have difficulties in building an effective state apparatus of governance (which harms both living standards and the business climate, level of infrastructure development, etc.), it still has room for improvement. For this to happen, the political establishment in Albania must make a real commitment and take bold decisions to work together honestly and with integrity to establish and adhere to strict standards of professionalism to build an effective and accountable public administration. Unless there is a full political commitment among the authorities to implement reforms to improve strategic planning; monitor and evaluate the performance of public servants; and ensure transparency and accountability of the authorities, achieving such a goal may not be possible at all. Nevertheless, given Albania's economic growth rate and the country's tendency to adopt the latest technology, positive conclusions can be drawn about future trends in its public administration.

Considering the characteristics of the Vlere region, it is worth noting that it is located in southwestern Albania and consists of three districts: Vlere, Saranda and Delvina. The municipality of Vlere consists of five administrative units (Vlere, Orikum, Kender, Novosele and Shushitse) with a total population of 202,000 inhabitants, including the Greek, Roma, and Egyptian minorities. It is the main port of the country, which is also very old. Because of its convenient geographical location, its districts are a very important natural factor for the development of transport infrastructure, and the creation of transit centres or points of trade turnover. Its geographic position also has a positive influence on the development of industries, such as agriculture (olive groves and fruit tree plantations) and tourism, due to the abundance of running water, represented by a dense network of rivers, creeks, underground water, springs, artificial sites, etc. This also contributes to the spread of urban life and the construction of megacities here. Oil, natural gas, bitumen, and salt are also produced in the region. The textile industry as well as the construction industry is developed in the city. However, the most important economic activity of the area is tourism. Many hotels, recreation centres and extensive beaches have been built here. The main attraction that attracts tourists to visit the city is its natural diversity: mountains, rivers and beaches are the main reasons to visit the city. The region also has a generally well-developed housing infrastructure. The city offers many residential areas, ranging from the coast to the hinterland.

Thus, it can be concluded that the last few years have seen positive trends in Vlore in terms of the development of its main industries, particularly tourism. The state authorities have probably also played a major role in this, as they have been able to create the conditions for the development of the region in which all this has been possible. Nevertheless, it is difficult to assess what role performance management has played in this. It is also worth noting that the development of the country and the Vlora region has been adversely affected by the COVID-19 crisis, which has caused major problems in the country's tourism sector. Due to the pandemic and travel restrictions, many countries closed their borders and introduced social distancing measures, which led to a significant decrease in the flow of tourists. During the crisis, many hotels, restaurants, shops, and other tourist businesses closed or operated with limited capacity. International tourist travel has been severely curtailed due to restrictions on entry and exit as well as flight cancellations. Domestic tourism has also declined due to travel restrictions and fear of the virus spreading. The economic impact on the tourism industry in the Vlore region was therefore significant. Many businesses, especially small and medium-sized enterprises, faced financial difficulties and loss of income. Unemployment in the tourism sector has increased and the contribution of tourism to the local economy has decreased. Nevertheless, the region has recovered rather quickly, including through the authorities' efforts to attract tourists and ensure their safety; marketing campaigns and proposed subsidies and incentives for tourism enterprises have also helped. In addition, domestic tourism, which has become more popular since the start of the pandemic and has partially improved the situation for the country's businesses, has also helped the recovery. It can be concluded that the activities of the authorities, both general and regional, during the COVID-19 pandemic were timely and significantly reduced the negative effects on the tourism sector, enabling Vlares to continue to develop without significant losses.

The following approaches can be taken to address the existing challenges in public sector governance. First, it is important to create a clear strategy on which public authorities will shape their subsequent actions when intervening in economic or social processes. This will improve the focus of efforts and avoid fragmented and unconnected initiatives. Second, the performance evaluation system should be improved, considering not only the quantitative but also the qualitative performance of civil servants. Third, opportunities for professional development and transformation must be provided so that civil servants can apply the latest techniques in their work (which will substantially increase efficiency). Public servants must be equipped with the necessary skills and knowledge to adapt to a rapidly changing environment and perform their duties effectively. Fourth, all bureaucratic procedures should be simplified as much as possible and, where possible, automated, thus reducing the time expenditures of such workers. The introduction of the latest technology in the system will also significantly increase the transparency of all internal processes, make the work of the authorities more understandable for citizens, and make it easier to check whether there are elements of fraud or corruption.

Thus, at this point, the hypothesis cannot be considered confirmed. This is due both to insufficient data available to form such conclusions and their ambivalence. On the one hand, state representatives are making steps towards rapprochement with the European Union countries and the economic situation in the country is improving, in the Vlora region. On the other hand, there are still problems in Albania related to the effective functioning of state structures. They are manifested, among other things, by corruption, which is still widespread. Therefore, this hypothesis requires further research and opinions from other scholars.

## 3. Discussion

An assessment of future trends in public administration was made by B. D. McDonald, J. L. Hall, J. O'Flynn и S. V. Thiel (2022). Researchers have noted that the world has made significant progress in this area over the past few decades. Because of its increasing role in economic development and ensuring adequate living standards for its citizens (as well as addressing major issues such as climate change, social justice, technology development, migration, increasing government capacity and improving rural governance), it has become so much research that it can be treated as a separate science. There has been a shift towards interdisciplinary collaboration, international and comparative work, and the development of new research methods. They emphasise that environmental, economic, or social problems which are being highlighted by scientists around the world need to receive special attention from public authorities and be dealt with in an integrated manner due to their interconnectedness.

The specifics of performance management in the public sector have been studied by E. Buschor (2013). The scholar generally describes that performance management in general has achieved better results in terms of management in the public sector. Research on performance management based on data from the UK was also conducted by J. Antony and D. Blackman (2014). They point out that performance management in the public sector is still a major challenge, and the expected improvements in efficiency, accountability, transparency, service quality and value for money cannot yet be fully assessed. There are also challenges in changing the culture of the public sector and the culture of performance management and different organisations are addressing different aspects. The solutions proposed to improve the situation are often generic, which often makes them ineffective in individual situations. Nevertheless, the overall situation is improving and the quality of governance, as well as the approaches to it, are changing for the better.

M. Sonderskov and R. Ronning (2021) explored the gap between the logic of public service and theories of street bureaucracy in the context of public service. The scholars describe that the public administration approach of satisfying the desires of individuals by providing them with services may be ineffective because it does not consider the more complex context in which the actors to whom services are provided may have different visions of what constitutes a successful outcome. They also note the role of choosing a public development strategy for the future well-being of the country, which should focus on the choice of approach to individuals and a focus on ensuring that the greatest benefits are realised for the country. Interestingly, they also suggest that politics and its context should not be separated from the process of value creation by the state.

T. H. Pham, T. T. H. Hoang, E. I. Thalassinos та H. A. Le, H. A. (2022) focused on assessing the impact of the quality of public administration on local economic growth in Vietnam. The study examined three components of public administration: public administration procedures (TT), combating corruption in the public sector (KS) and public service delivery (CU). Findings from the econometric analysis show that improving the quality of public administration has a positive impact on local economic growth: a 7.3% improvement in public administration procedures, a 7.9% improvement in anti-corruption, and a 17.6% increase in public service delivery. Based on these indicators, the researchers point to the high role of local government representatives for better management of all processes controlled by the state. Besides, the scientists suggest paying more attention to the problems of fighting corruption and using the latest technologies to counteract it. They also suggest simplification and streamlining of administrative procedures, for which implementation of digital technologies and digital transformation, in general, would be useful. It is worth noting that corruption in Albania also remains one of the most widespread problems preventing the country from developing. It covers different areas of life, including the public sector, law enforcement, the judiciary, the business environment, and other areas. While the Albanian government has made efforts in recent years to combat corruption and improve transparency and accountability in public administration, it remains a significant problem in Albania and its complete eradication requires further efforts and improvement of institutional mechanisms, effective investigation, punishment of perpetrators and creation of a transparent and responsible culture in all spheres of society.

The peculiarities of quality management in Australia were studied by J. Taylor (2021). The scholar notes that quality management in the country is at a high level, especially it's component responsible for the accountability of public authorities. Nevertheless, public authorities should shift their focus from the technical to the non-technical aspects of public sector performance. Public leaders and managers should emphasise the strategic and developmental aspects of performance management to change the employees' attitude towards it as a control tool. Strong leadership and commitment from senior managers are important, along with the provision of adequate resources and support for implementation. Central governing bodies need to go beyond mere talk and take action to motivate organisations and enable them to improve performance through performance management. In other words, developing and implementing the latest technology in performance management processes will not be enough to achieve impressive results because of the still present important human factor.

One of the most important components for improving performance management processes in the public sector is digitalisation. Not only does it speed up or automate many processes that had to be done manually, but it also increases their transparency and therefore makes it impossible (or at least difficult) for public servants to do anything illegal. Therefore, it is still relevant to consider and confirm the role of digitalization for its implementation in public administration processes. Thus, A. Androniceanu, I. Georgescu and S. Oana (2022) describe the positive impact of digitalisation on the public sector in the European Union, with special emphasis on the opportunities for fighting corruption. It is worth noting that the application of the latest technology in such a context is also very relevant for Albania, which, due to its socialist past, still has some difficulties, both with the misuse of its powers by civil servants and the often-present political motivation for hiring officials.

Thus, for Albania, many of the challenges associated with increased efficiency in public sector management remain relevant. Nevertheless, the overall situation is gradually improving as the country develops and becomes more integrated into European society. The same applies to the Vlora region, where the situation has improved considerably over time, primarily due to the development of the tourism industry and the well-chosen policies of state representatives. Considering the current trends, it is to be expected that in the future the situation in the context of regional development will improve and so will the methods of efficiency management in the state sector, first through more active use of the latest technologies in monitoring, planning and implementation processes.

## Conclusions

Thus, the study assessed the effectiveness of public sector governance in Albania. It was shown that, due to the country's development characteristics, which are primarily related to its socialist past, the challenges of good governance in the public sector remain significant: the rising expectations of citizens, budgetary constraints and the need for greater transparency and accountability. Although government officials have used various methods to counteract these, they have so far not yielded sufficient results. In addition, significant corruption remains a problem for the country. The most effective solution to the problems of corruption can be achieved through the introduction of innovative methods and technologies that can automate many processes related to the provision of public services and minimise the interaction of government representatives with households or businesses. Their subsequent increased adoption should be a major part of Albania's development strategy in the future.

The study described the characteristics of the development of the Vlore region. It was shown that due to its geographical location, the area has become one of the most important trading and tourist centres for the country. Furthermore, the Vlore region has developed several industries, as well as agriculture. Overall, the area has recently experienced significant positive developments, despite the spread of the COVID-19 pandemic and its negative impact on the tourism industry. State support in terms of assistance to small and medium-sized enterprises has played a major role in solving these problems, as well as the trend towards the expansion of domestic tourism.

An evaluation of the public sector management effectiveness in Albania in other regions remains relevant for future research, as well as an evaluation of foreign experience in this context, to enable more qualitative management.

## Credit Authorship Contribution Statement

Authors have contributed equally to this work.

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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# Mapping the Country's Dependence on Indonesia's Coal Import Market

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**Abstract:** *Indonesia is one of the world's largest producers and exporters of coal. Its strategic geographical location facilitates coal export activities to consumer countries. In addition, the quality of Indonesian coal is also very suitable for steam power plants, especially sold at competitive prices on the international market. This research highlights how the world's largest coal-importing countries depend on the Indonesian coal import market. This means that Indonesian coal significantly influences the world's energy contribution. Based on this fact, the author states that the coal that Indonesia exports to importing countries dramatically affects the economic conditions of these countries. Driven by population increases, economic expansion, improved quality of life, and energy use, coal is an important energy source. Therefore, many countries import coal to meet domestic energy needs and reserve coal supplies long-term. To find out this, the author uses a qualitative research method, descriptive analysis with a dependency theory approach, that is analyzed in a world macro context using a world system perspective. In addition, the author also uses mean calculations to find the average result of the amount of coal imports for each country.*

**Keywords:** Indonesian coal; import; market dependence.

**JEL Code:** A11; F43; P33; R11.

## Introduction

As one of the three primary energy resources, coal plays a crucial role in meeting national energy needs and driving economic growth (Wang *et al.* 2021). Many countries use coal as the primary raw material for electricity generation (Ahmad 2016). Despite numerous studies highlighting its environmental impacts, global trade in coal commodities continues to grow (Gosens *et al.* 2022). Not all countries have abundant coal resources, and Indonesia is only one of a small number. As climate change threatens human life, the demand for coal as a primary energy source continues to grow, especially in the Asian region. This creates a dependency between countries, both as coal suppliers and importers.

Since the 1970s, coal has been central to Indonesia's energy policies. According to Indonesia's balance of resources and reserves for minerals, coal, and geothermal, Indonesia has 35,05 billion tons of total coal reserves and 99,19 billion tons of resources in 2022 (Juarsa *et al.* 2023). Coal is a fossil fuel formed from the remains of plants and is considered a superior energy source to other sources due to its relatively substantial potential. Coal is used as an industrial material in various sectors, such as power generation, steel, cement, and paper production (Irwandy Arief 2014). The industry is a productive sector that continuously strives to enhance economic growth. Due to the abundance of coal, the government is working towards cleaner coal technology to reduce greenhouse gas emissions, mainly from steam power generation.

Coal is a crucial resource for energy generation and a top-priority export commodity. Indonesia, the world's largest coal exporter, has significant linkages to the political system at regional and national levels due to coal money being one of the state budget sources (IEA 2022). The entire industrial procurement chain is a significant source of income that fosters economic growth. Coal mining is not only a commodity for trade but has also become a political commodity. According to data from the Ministry of Energy and Mineral Resources, Indonesia produced 775 million tons of coal in 2023, a 13.01% increase from the previous year (ESDM 2024).

Indonesia's coal production is relatively large. Most of this output is shipped to various countries that still rely on coal as a source of electrical energy. Based on the decision of the Minister of Energy and Mineral Resources of the Republic of Indonesia, Number 267 of 2022, it stipulates that the percentage of coal sales for domestic needs is set at 25%, and the remaining total production can be exported (ESDM 2022). The realisation of Indonesian coal exports in 2022 reached 687 million tons, making Indonesia the largest coal-exporting country in the world (Garside 2023). The country's destinations for Indonesian coal exports are those dominated by the Asian region, including China, India, Japan, Malaysia, South Korea, the Philippines, and others (BPS 2022). China is the primary market for Indonesian coal exports and has also invested in Indonesia's coal mining sector, followed by India, Japan, Korea, and other countries.

There has been limited research on Indonesia's coal exports and imports. Previous studies have analyzed and shown the influence of coal exports, consumption, and technology utilization. However, there is currently no research that specifically focuses on the dependence of importing countries on the Indonesian coal market. This makes the author want to analyze and map countries' dependence on Indonesian coal imports and see the importance of Indonesian coal to the world's energy contribution. Research written by Deni Aditya and Randy Admi discusses the determinants of coal import demand in destination countries and their influence on Indonesia (Susanto and Admi 2021). This study used six Asian countries importing Indonesian coal from 2008 to 2018 to reveal that exchange rates, foreign exchange variables, coal production, and country economic growth significantly affect Indonesian coal. Another study by Arif Setiawan, Aryo P, *et al.* discusses the reliability of coal production as a source of electrical energy (Setiawan Arif *et al.* 2020). This research shows that the Indonesian government has reduced the export of coal materials to fulfill domestic energy security. The results of this study show that export restrictions to prioritize domestic needs positively impact Indonesia's economic growth, where the export reduction is accompanied by increased domestic coal use. So, the efficiency of coal utilization has slowly become renewable energy. On the other hand, the policy of reducing and even banning coal exports harms Indonesian coal-importing countries. Research by Dessy Nathalia, Donny, and Filda Citra explained that the export ban policy issued by the government had an impact on more than 10 million PT PLN customers, including domestic industries and importing countries, which resulted in pressure from entrepreneurs and coal exporting countries to lift the ban (Natalia *et al.* 2022). Some of the world's largest coal-importing countries, such as Japan, South Korea, and the Philippines, also specifically sent official requests to the Ministry of Energy and Mineral Resources of the Republic of Indonesia to lift the ban because these countries have depended on coal for their electricity and Indonesia is their main exporter.

In the end, coal imports allow Indonesia to increase its international market share and become one of the factors boosting global coal prices. However, the challenge is how the country can optimize this opportunity. This is undoubtedly a consideration for the Indonesian government. Therefore, this study examines how important Indonesian coal is to the world's energy contribution by analyzing and mapping which of the world's largest importing countries depend on the Indonesian coal import market. Thus, this research can prove the importance of Indonesian coal to the national energy sector of importing countries.

## 1. Literature Review

In looking at countries' dependence on Indonesian coal imports, the author uses a dependency theory approach that is analyzed with a world macro context using a world system perspective. In 1970, Santos's writing entitled "The Structure of Dependence" explains that dependence is a situation in which the economies of certain countries are conditioned by the development and expansion of the economies of other countries, which are the first economic targets (Santos 1970). Dependency theory became very influential in Latin America in the 1960s and 1970s due to modernization theory and free trade policies, which originated in the West. After the end of formal colonialism, value transfers continued to flow from the South to the North. In this case, core countries in the North continued to benefit from extracting their wealth from peripheral countries in the South. Hence, this interdependence relationship is assumed when the dominant country can expand and become self-sufficient, while the dependent country only reflects the expansion. Dependence here is a condition of asymmetrical relations between two countries, where countries that import Indonesian coal depend on Indonesian coal (Kartono and Nurcholis 2016). Initially, this theory was present due to criticism of the assumption that economic development at the beginning of the Cold War would benefit every country in the international system. However, in reality, economic prosperity in a country can create stratification between countries in the world. This causes underdevelopment in a country and makes these countries more dependent. At the same time, world systems theory or world-systems perspective is a macro-scale multidisciplinary approach to world history and social change (Christofis 2019). Immanuel Wallerstein developed it to emphasize the role of economic and political structures in shaping global inequality and the exploitation of peripheral and semi-peripheral regions by core countries. It examines the historical development of the modern world system and how it perpetuates global inequality.

These two theoretical approaches are intended to analyze and map the study of Indonesian coal exports by examining the underdevelopment of importing countries. Thus, the author collects information (qualitative data) that supports this research and uses it as supporting data for the concepts used. Dependency on coal imports here is not solely assessed based on the quantity of coal imported but also on the consistency of a country in importing Indonesian coal.

## 2. Research Methodology

In this article, the author used a qualitative research method characterized by descriptive analysis. Qualitative research involves several targeted actions, including identifying the data type, assessing its significance, and validating and verifying it accordingly (Denzin, Norman K 2018). The explanations the author will provide to the readers will result in a description based on the observed events. The subject of this research is the mapping of countries that are dependent on Indonesian coal, while the object is the coal export activities carried out by Indonesia. This research uses library research techniques, including collecting information, facts, and data from books, e-books, journals, e-journals, working papers, and relevant articles or news. Subsequently, the collected data is processed and analyzed for its validity.

This research also uses descriptive statistical analysis techniques, which help organize and summarize experimental data to make data-based decisions or form intuitive conjectures or hypotheses (Fisher 2009). Statistical analysis is a crucial instrument in research, involving exploring patterns, trends, and correlations using quantitative data (Indeed 2023). In qualitative research, statistical tools help researchers organize and present findings through descriptive statistics. This technique presents data through graphs, tables, and mean calculations. The average (mean) is commonly used in statistics using the symbol ($\bar{X}$) read “exbar.” Average or mean is a group explanation technique based on the average value of the group. The average result of a single data set can be found by adding all the data and dividing it by the available data. This study uses the mean calculation to find the average result of the number of coal imports for each country. The average formula (mean) for single data is:

$$\bar{X} = \frac{\mathrm{X1} + \mathrm{X2} + \cdots + \mathrm{Xn}}{\mathrm{n}}$$

Or

$$\bar{X} = \frac{\sum \mathrm{Xi}}{\mathrm{n}}$$

Description

$\bar{X}$ = average (mean)

X = data points

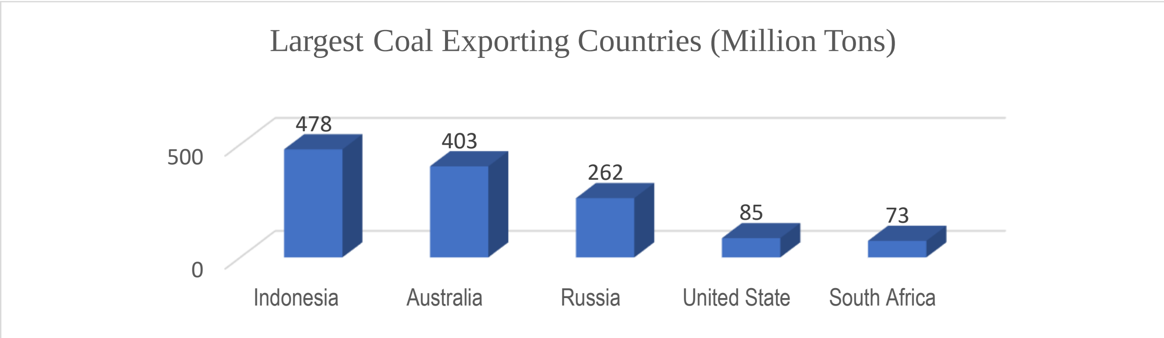
$\mathrm{n}$ = number of data points

## 3. Research Result and Discussions

### 3.1 Indonesia’s Coal Exports

The mining sector, including coal mining, is one of the pillars of economic growth. Coal remains an essential source of affordable and cheap energy for the Asia-Pacific region (ESDM 2021a). Indonesia's coal production has grown steadily since independence despite occasional dips. The high level of coal production is mainly due to the growing demand for coal in export markets. Several regions in Indonesia produce coal, making Indonesia a significant player in the coal sector. This abundance of resources has positioned Indonesia as one of the world's largest coal exporters. While Indonesia is not the world's largest coal producer, it is the largest coal exporter. According to the International Energy Agency (IEA), Indonesia will be the world's largest coal exporter in 2022 (see Figure 1), followed by Australia, Russia, the United States and South Africa (IEA 2022). This shows that not all coal-producing countries export their coal; much of the production is used for domestic energy consumption.

Figure 1. Worldwide Coal Exporting Countries in 2022




*Source*: International Energy Agency (IEA), 2022.

Indonesia is important in the global coal market because of its strategic location. Its proximity to consuming countries facilitates export activities and reduces logistics costs and shipping time. In addition to its geographical advantage, Indonesian coal is highly suitable for steam power generation due to its high energy, low sulfur, and low ash content (Nathanael 2020). Indonesia produces both medium-rank and low-rank coal in abundance when considering coal categories. Low-rank coal is mainly used to meet domestic demand, while medium-rank coal is exported at competitive prices internationally (Investment 2018). Indonesian coal also has a low sulfur content, considered environmentally beneficial. The export of coal products is regulated according to the minimum limit set by the Minister of Energy and Mineral Resources (ESDM), which is 75% of total production (ESDM 2022). These factors make Indonesia one of the major players in the global coal market, playing a crucial role in providing an energy source for countries worldwide.

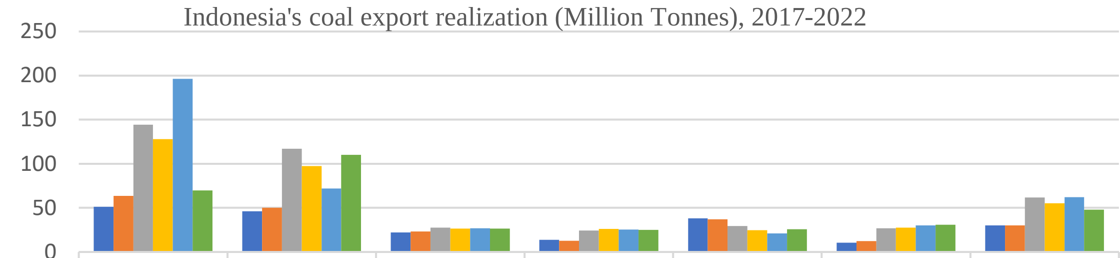
Although Indonesia has a large production and export of coal, the government is gradually promoting renewable energy policies to reduce dependence on non-renewable resources and ensure environmental sustainability. While coal remains an economical energy source, it is crucial to consider its long-term environmental impact. This is to keep electricity prices affordable for the public and support economic growth and competitiveness of products in the global market. However, the next step is prioritizing renewable energy, aiming to reach a 23% share by 2025 (ESDM 2021c). In this case, the government is working to make coal mining more environmentally friendly and energy-efficient. As the adoption of renewable energy becomes more widespread, global demand for coal may decline as other countries switch to cleaner and more sustainable energy sources.

### 3.2 State Dependence on Indonesia's Coal Import Market

In the current era of globalization, economic improvement is focused on international trade driven by demand. This demand arises from the need for a product that a particular country cannot produce or supply. One of the requirements for any country to sustain its industries is the availability of fuel to power production machinery, such as coal. The commodity of coal has benefited the economy through exports, generating foreign exchange for the country (Dewi 2018). Despite Indonesia's significant coal production, much of this production is exported to countries worldwide that still rely on coal as a source of electrical energy. Indonesia's coal exports will reach 435 million tons in 2021, with China, India, Japan, Malaysia, South Korea, and other countries being the primary consumers (ESDM 2021b).

Figure 2 shows that from 2017 to 2022, the average share of Indonesia's coal exports was 47.84 million tons to the six largest importing countries. Coal exports will decline in 2020 due to the COVID-19 pandemic, which has reduced Indonesia's coal mining sector. Moreover, the largest importers of Indonesian coal are mainly Asian countries, including China, India, Japan, Malaysia, South Korea, and the Philippines. According to data from the Central Statistics Agency, India has overtaken China as the largest importer of Indonesian coal in the first nine months of 2022, with a total of 90.14 million tons (Direktorat Statistik Distribusi 2022). Looking at the percentage of Indonesian coal importers, China and India have become the most important competitors. Several countries, except for China and India, have one thing in common: the need for more natural resources. One of the natural resource shortages is fossil fuels, which means that these countries cannot meet their energy needs in large quantities, leading to the import of raw materials from other countries.

Figure 2. Indonesia's Coal Export Realization, 2017-2021




| | China | India | Jepang | Malaysia | South Korea | Filipina | Mean |
|---|---|---|---|---|---|---|---|
| 2017 | 51.2 | 46.24 | 22.18 | 13.65 | 38.07 | 10.44 | 30.29 |
| 2018 | 63.43 | 49.96 | 23.08 | 12.7 | 37.15 | 12.21 | 30.08 |
| 2019 | 144.41 | 116.95 | 27.68 | 24.19 | 29.55 | 26.84 | 61.6 |
| 2020 | 127.79 | 97.5 | 26.68 | 26.22 | 24.83 | 27.48 | 55.08 |
| 2021 | 196.24 | 72.12 | 26.97 | 25.59 | 21.01 | 30.16 | 62.01 |

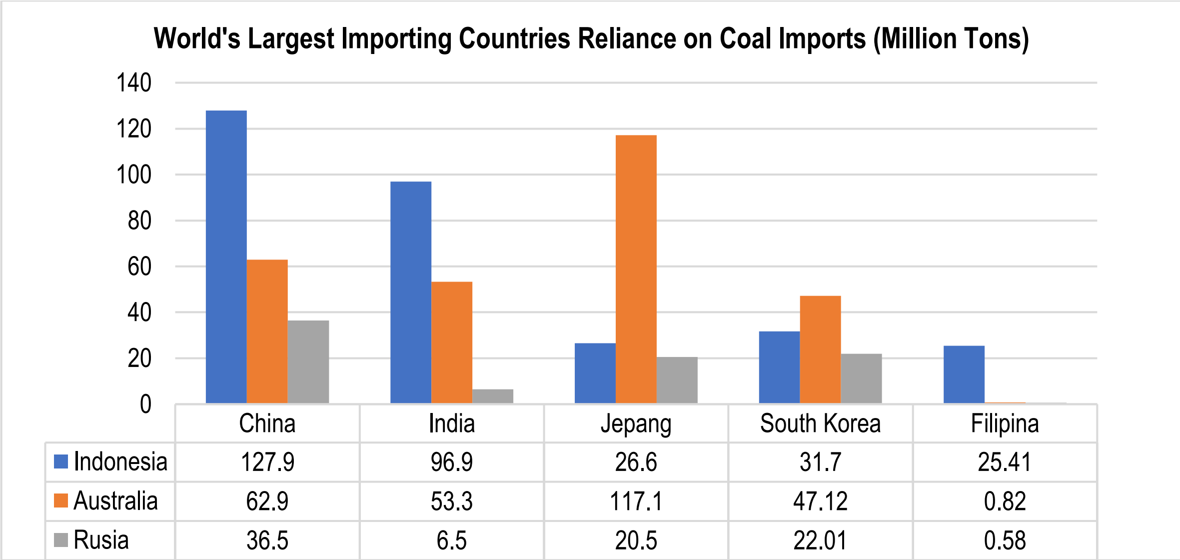
*Source*: Ministry of Energy and Mineral Resources of Indonesia, 2023.

Apart from countries in the Asian region, Indonesian coal is also in demand from several European Union (EU) member states. According to the Central Statistics Agency, several EU countries imported Indonesian coal in 2022, reaching 5.7 million tons, an increase of 1,373% compared to the previous year, when they imported only 862 thousand tons (BPS 2022). Meanwhile, Indonesian coal exports to Europe in 2019 amounted to 1.67 million tons (BP 2022). The largest importer of Indonesian coal in the EU is Poland, which imported 2.38 million tons of Indonesian coal, although it did not import any Indonesian coal the previous year. Italy is in second place with imports of 1.52 million tons and, like Poland, did not import any Indonesian coal last year. After Poland and Italy, the Netherlands is in third place with total coal imports of 1.37 million tons in 2022. In addition to these three countries, Spain, Croatia, and Slovenia also consume Indonesian coal. The high demand for Indonesian coal in several EU countries is mainly due to the energy crisis and the Russia-Ukraine conflict. The need for coal in countries that did not previously buy from Indonesia is due to their search for alternatives to reduce natural gas consumption in the face of tight supplies and rising prices. Sanctions imposed by the EU on Russia over its military actions in Ukraine have led to Russia halting coal exports to Europe in August 2022. In the longer term, the geopolitical risks posed by the invasion of Ukraine have strengthened the government's resolve to facilitate an energy transition away from fossil fuels. This means that global coal demand is expected to peak in 2023 and stabilize after that (Agnolucci, Paolo *et al.* 2023).

Coal is the world's most abundant source of electricity, currently providing more than 36% of the world's electricity (SME 2021). Coal-fired power plants provide affordable, reliable, and consistently available electricity on demand to meet energy consumption needs. With much of the world lacking access to modern and clean energy, coal remains critical to alleviating global energy poverty. The industry's challenges lie in developing technologies and pathways to zero emissions, particularly carbon dioxide, which scientists have identified as a factor in climate change. In addition, coal serves many industrial purposes, the most important of which are steel production, which uses metallurgical coal or coke, and cement production. According to the World Coal Association, coal produces 37% of the world's electricity and more than 70% of the world's steel (WCA 2020). This means that coal continues to play a critical role in addressing energy poverty by providing an affordable energy source for countries that still lack access to adequate energy. As a result, many countries import coal to meet their domestic energy needs.

Other countries globally have also responded to the high demand for less natural gas by burning more coal. Coal remains the dominant fuel for power generation. This suggests that Indonesia's coal-importing countries continue to need coal to meet domestic consumption, even though they also produce their coal. Indonesian coal remains a significant supply source for several countries, including some of the world's largest coal importers. Developed countries such as China, India, and the Philippines rely on Indonesia as a source of coal supply through coal exports. The other two largest coal importers, Japan and South Korea look to Indonesia as their second source of coal imports after Australia.

Figure 3. Mapping the Country's Dependence on Coal Imports (Million Tons)




*Source*: Author's calculations from various sources.

If coal exports were to cease, countries that rely on coal as an energy source or raw material would experience severe disruptions in production. A halt to coal exports by producers could lead to reduced production of goods and services and even the closure of some businesses. If importing countries have to switch to more expensive alternative energy sources or import coal from other sources at higher costs, energy costs for industry could increase significantly. With higher production costs and the potential for energy shortages, inflation could rise, impacting consumer price levels. As a result, Indonesia remains a crucial player in the global coal market, and significant importing countries continue to look to Indonesia to meet their energy needs.

### 3.1.1 China's Dependency Level

China, the primary market for Indonesian coal, is the world's largest producer, consumer, and importer of coal. According to the International Energy Agency, China's coal production will reach 3.9 billion tons in 2021 (IEA 2022). With a total consumption of 86,157 exajoules in 2021 (BP 2022). Coal accounts for over 56,2% of China's electricity generation (VOA 2023). These figures indicate that China will be the world's largest coal consumer in 2021. China's rapid economic growth and urbanization have increased its energy consumption, and coal remains one of the most affordable and reliable sources of large-scale electricity and heat. The Chinese government also plans to increase domestic coal production by 12 million tons daily (Tachev 2022a). Despite being the world's largest coal producer, China's coal development is relatively small and limited compared to other countries. Although coal is a primary energy source in China, the country still needs to import coal from other countries to meet its targets and policies. According to the IEA, China's total coal imports will reach 338 million tons in 2021, with Indonesia as the main supplier (IEA 2022). China's coal imports are divided into coking coal, bituminous coal, and lignite. These three types of coal are used for thermal power generation and are collectively referred to as steam coal in China (Newswire 2023). China's coal imports are dominated by steam coal, which has a relatively low average price.

Table 1. China's Coal Imports by Source

| Source/Year | 2017 | 2018 | 2019 | 2020 | 2021 | Mean |
|---|---|---|---|---|---|---|
| Indonesia | 108.9 | 63.43 | 144.41 | 127.79 | 193.7 | 127.86 mt |
| Australia | 83.41 | 64.63 | 92.75 | 60.62 | 13.2 | 62.92 mt |
| Rusia | 25.3 | 27.59 | 32.38 | 37.66 | 59.4 | 36.46 mt |

*Source*: Author's calculations from various sources.

Indonesia has become the leading destination for China's coal imports to meet its declining domestic demand. More than 62% of China's coal imports come from Indonesia, with a further 17% coming from Russia. These two countries account for almost 80% of China's coal imports, the remainder coming from various countries, including Australia and the United States. Table 1 shows that Indonesia will remain China's top source of coal imports for the five years from 2017 to 2021, averaging 127.86 million tons per year, followed by Australia at 62.92 million tons per year and Russia at 36.46 million tons per year. The use of coal in China has become a critical aspect of its economy and society. If Indonesia decided to stop exporting coal to China, it would have significant consequences for China and the global coal market. China's dependence on coal imports could increase coal prices if supplies from other sources cannot quickly replace those from Indonesia. This could also trigger fluctuation in the global market, affecting coal producers and consumers worldwide.

In 2021, 15% of U.S. coal exports were shipped to China (Tachev 2022a). This increase occurred after China banned coal imports from North Korea. However, Indonesia remained China's primary source of coal imports, with Russia continuing to serve as a secondary source. China has also established cooperative relations outlined in the Indonesia-China Energy Forum (ICEF) working agreements. Energy and mineral cooperation agreements and a Memorandum of Understanding (MoU) were discussed during the forum (ESDM 2023). In 2021, Indonesia had the opportunity to host the 7th ICEF. These mutually beneficial cooperation agreements provide China with the substantial energy resources it needs to meet and compete in its industrial sector while offering Indonesian coal industry stakeholders the opportunity to increase coal export volumes to China.

### 3.1.2 India's Dependency Level

India is the world's third-largest energy consumer, with electricity demand growing at 4.7% annually (Ministry of Coal 2022). India has now become one of the leading destinations for Indonesian coal exports. Coal exports from Indonesia to India have surged significantly since 2019, driven by a power crisis caused by heat waves, with temperatures reaching 45 degrees Celsius (Asmarini 2022). With a growing population, expanding economy, and improving quality of life, energy consumption in India is expected to increase. Coal is expected to play a prominent role in India's energy scenario, given the limited potential reserves of oil and natural gas, environmental restrictions on hydropower projects, and geopolitical perceptions of nuclear power (Ministry of Coal 2021). The primary objective of India's coal policy is to improve the industry's financial performance by creating a competitive coal sector. A financially viable power industry will be essential to support coal sector reforms (IEA 2002).

Table 2. India's Coal Imports by Source

| Source/Year | 2017 | 2018 | 2019 | 2020 | 2021 | Mean |
|---|---|---|---|---|---|---|
| Indonesia | 91.63 | 112.88 | 116.66 | 92.53 | 71.04 | 96.94 mt |
| Australia | 45.81 | 48.17 | 46.78 | 54.95 | 71.04 | 53.34 mt |
| Russia | 6.25 | 4.92 | 8.26 | 6.75 | 6.27 | 6.5 mt |

*Source*: Ministry of Coal Lok Saba.

India continues to meet its coal supply needs with imports of Indonesian coal. Table 2 shows that Indonesia will remain India's leading source of coal imports from 2017-2021, consistently competing with coal imports from Australia. During 2017-2021, India imported an average of 96.94 million tons of coal annually from Indonesia, followed by Australia at 53.34 million tons per year and Russia at 6.5 million tons per year. According to the Ministry of Energy and Mineral Resources, in 2021, India was the second largest destination for coal exports after China, while in the previous year, India was the top destination for coal exports (ESDM 2021b). In 2022, India again became the largest destination for coal exports. This means India and China have become competitors in the Indonesian coal market. Indonesia consolidates its position as the largest coal supplier to India, increasing its market share from over half in 2021 to two-thirds in 2022. India's share has increased at the expense of Australia and South Africa, while Russia has overtaken the United States to become the fourth-largest supplier to India (Varadhan 2023).

Coal is the most essential and abundant fossil fuel in India. According to the International Energy Agency, India's coal production will reach 805 million tons in 2021 (IEA 2022). With a total consumption of 20.09 exajoules in 2021 (BP 2022). Total imports were 207 million tons (IEA 2022). As India's coal production grows, so does its energy demand. With coal accounting for more than 55% of India's total power generation, it is clear that India needs a long-term supply of coal. Indonesia, like China, is India's primary coal import market. Cooperation between Indonesia and India began with a meeting in 2009 to discuss the establishment of a Joint Working Group (JWG) in the coal sector. This meeting considered mutual interests in promoting bilateral cooperation, particularly in the coal sector (Amaliya 2021).

### 3.1.3 Japan's Dependency Level

Coal is the second largest primary energy source in Japan after oil. According to BP PLC, coal production in Japan in 2020 will be 0.77 million tons (BP 2020). Japan's coal production has been relatively low, with a peak of 17.69 million tons in 1981. Meanwhile, coal consumption is relatively high, reaching 4.8 exajoules in 2021, an increase of 0.23 exajoules from the previous year (BP 2022). Looking at this data, it is clear that the use of coal to meet Japan's industrial needs is significant. However, Japan's natural resources must be improved to meet this demand. Japan imports almost all (99%) of its coal, mainly from Australia, followed by Indonesia and Russia. More than 60% of Japan's coal is imported from Australia, and Japan's coal demand is critical to developing Australia's coal export industry (The Australia Institute, 2021). The situation is similar for other fossil fuels. Japan needs to import coal to meet 96% of its energy needs (Tachev 2022b). However, in 2020, Japan's coal imports declined from the previous year, mainly due to reduced demand from coal-fired power plants during the COVID-19 pandemic. According to the Australian Department of Industry, Science, Energy, and Resources, more than half of total imports are thermal coal, with the remainder being metallurgical coal (Global Data 2021).

Table 3. Japan's Coal Imports by Source

| Source/Year | 2017 | 2018 | 2019 | 2020 | 2021 | Mean |
|---|---|---|---|---|---|---|
| Indonesia | 32 | 29 | 22.4 | 27.62 | 21.91 | 26.6 mt |
| Australia | 119.13 | 115.3 | 127.16 | 103.54 | 120.51 | 117.1 mt |
| Russia | 21 | 18.9 | 22.4 | 21.71 | 20.08 | 20.5 mt |

*Source*: Author's calculations from various sources.

Table 3 shows that for five years, from 2017 to 2021, Australia was Japan's leading source of coal supply, with an average import of 117.1 million tons per year. In addition, Indonesia is the second largest coal supplier to Japan, with an average import of 26.6 million tons per year, followed by Russia with an average of 20.5 million tons per year. Initially, China was the leading supplier of coal to Japan. However, due to instability and export regulations offered by China that were considered detrimental to Japan, it became an opportunity for Indonesia to enter the coal export market to Japan. Indonesia offers quality and benefits that do not harm Japan or Indonesia by reducing import duties (Salsabila *et al.* 2022). This is undoubtedly an opportunity for Japan to get coal at a reasonable price and quality, considering that Japan does not obtain this import duty reduction policy when importing coal from China and Australia. At the beginning of 2022, the Indonesian government banned Indonesian coal exports to fulfill domestic needs in a crisis. Due to the ban, many countries, including Japan, urged Indonesia to lift its ban immediately. The Japanese Embassy in Jakarta requested the Ministry of Energy and Mineral Resources (ESDM) to end the coal export ban as it has seriously impacted the Japanese economy. In addition, the Embassy requested that high-calorific coal not used by local power plants be excluded from the export ban (Christina, Bernadette, 2022). The embassy also requested that five ships loaded with coal be allowed to depart for Japan. Japan has invested in coal mining projects in Indonesia and established partnerships in the energy sector (Darmastuti, Juned et.al., 2021). In addition, Indonesia and Japan also have a cooperation agreement known as the Indonesia-Japan Economic Partnership Agreement (IJEPA). IJEPA has benefited both countries. This agreement makes it easier for Indonesia to enter the Japanese industrial market and offers policies that benefit both. The IJEPA has also facilitated import and export activities due to reduced import duties. Indonesia is now a significant supplier of coal to Japan.

### 3.1.4 South Korea's Dependency Level

Although coal is a significant source of greenhouse gas emissions, it remains an essential energy source in South Korea. South Korea relies heavily on imports to meet most of its energy needs. The country has been the world's fourth-largest coal importer since 2010 (World Energy Statistics 2022). 2021 South Korea will import 126 million tons of coal (Coal Researches Network 2022). In contrast, South Korea's domestic coal production is only 1.2 million tons annually. In 2021, total coal consumption in South Korea will reach 117 million tons (Ener Data 2022). Coal energy-dependent industries such as manufacturing and metallurgy have contributed to the increase in coal consumption in South Korea. With rising coal consumption and limited domestic production, South Korea has become highly dependent on coal imports in recent decades.

Table 4 shows that for five years, from 2017 to 2021, Australia was the largest source of coal imports in South Korea, with an average of 47.12 million tons per year. In addition, Indonesia and Russia are the primary sources of South Korea's coal supply, averaging 31.7 million tons and 22.01 million tons per year, respectively.

South Korea must import coal to fulfill 28.5% of its energy needs as the second energy source after oil (Bang 2021).

Table 4. South Korea's Coal Imports by Source

| Source/Year | 2017 | 2018 | 2019 | 2020 | 2021 | Mean |
|---|---|---|---|---|---|---|
| Indonesia | 36.80 | 37.15 | 29.61 | 24.83 | 30.16 | 31.7 mt |
| Australia | 43.38 | 43.4 | 49.35 | 37.2 | 62.3 | 47.12 mt |
| Russia | 3.66 | 29.18 | 28.2 | 26.66 | 22.33 | 22.01 mt |

*Source*: Author's calculations from various sources

Currently, 30% of the country's power generation relies on coal. This means that Indonesia is also an essential source of coal supply for South Korea. The stability of the coal supply from Indonesia is one of the critical factors in meeting the country's energy needs. In early 2022, Indonesia announced a ban on coal exports. In response, the South Korean government urged the Indonesian government to lift the coal export ban. Despite these actions, the South Korean government officially stated that Indonesia's ban on coal exports would have minimal impact on the Korean economy. As a country that allocates much investment in the manufacturing sector and digital economy, some concerns that continued threats to energy supply could hamper the country's growth prospects, so Indonesia's coal export ban shows that South Korea is still highly dependent on coal (Korea View 2022).

### 3.1.5 Philippines's Dependency Level

The Philippines generates around 60% of its electricity from coal, making it one of the largest sources of carbon dioxide emissions (Shiga 2022). In 2020, the country declared a moratorium on proposals to build new coal-fired power plants, instead aiming to make significant gains from renewable energy. However, concerns about the cost and reliability of renewable energy have troubled the government. During the rainy season, there are concerns that the country's solar power supply may not be sufficient throughout the year. The government has provided policy incentives for developing new mines, but most permits are for small-scale mining. This is unlikely to increase coal production to the required scale, potentially leading to future coal shortages and increased coal imports. As a result, coal remains a primary energy source, and the Philippines continues to rely on coal-fired power plants.

Table 5. Philippines Coal Imports by Source

| Source/Year | 2017 | 2018 | 2019 | 2020 | 2021 | Mean |
|---|---|---|---|---|---|---|
| Indonesia | 19.663 mt | 23.285 mt | 24.979 mt | 28.603 mt | 30.513 mt | 25.41mt |
| Australia | 1.401 mt | 1.245 mt | 710.607 tt | 538.212 tt | 242.197 tt | 0.82 mt |
| Russia | <984 thousand | 1.317 mt | 160.990 tt | 278.005 tt | 186.000 tt | 0.58 mt |

*Source*: Department of Energy, Philippines.

Table 5 shows that Indonesia remained the primary source of coal imports for the Philippines over the five years from 2017 to 2021. Annual coal imports from Indonesia increased, averaging 25.41 million tons per year. Nearly 98% of the Philippines' coal demand of 31.23 million tons in 2021 was supplied by Indonesia. Apart from Indonesia, Australia also supplied coal to the Philippines with an average of 0.82 million tons and 827,400 tons per year. The rest came from various countries, including Russia, with an average of 0.58 million tons or 585,200 tons per year. The Philippines is also a regular buyer in the international seaborne market. Total coal imports for this country reached 31.23 million tons in 2021 and 29.52 million tons in the previous year (CNMD 2022b). In 2021, total coal consumption in the Philippines reached 25.48 million tons, while the country produced only 14.37 million tons of coal (CNMD 2022a). This means the Philippines heavily depends on coal imports, as total consumption exceeds domestic production. The Philippines purchases 2.3 million tons of Indonesian coal monthly to meet its power generation fuel needs.

In 2019 and early 2022, Indonesia briefly banned coal exports to ensure sufficient domestic supply. Philippine Energy Secretary Alfonso Cusi has appealed to Indonesia to lift its coal export ban, saying that the policy would hurt an economy that relies heavily on fuel for power generation (Kurniawan 2022). Mr. Cusi requested in an official letter sent to Indonesia's Minister of Energy and Mineral Resources through the Ministry of Foreign Affairs. Based on data from the Philippines' Department of Energy, Indonesia has been the largest source of coal imports since 1988 (CNMD 2022b). Apart from Indonesia, Australia, Vietnam, and Russia also exports coal to the Philippines. In 2021, more than 0.7% of the Philippines' coal imports came from Australia, 0.9% from Vietnam, and 0.6% from Russia (CNMD 2022a). The rest comes from various countries, including Korea, India, and China.

## Conclusions and Further Research

This research confirms that many countries heavily rely on coal production from Indonesia. The coal output from Indonesia impacts various economic activities of importing countries, especially as an energy source for the global community. Using dependency theory further solidifies Indonesia's position as one of the world's largest coal exporters. Several countries, including China, India, Japan, South Korea, and the Philippines, heavily rely on Indonesian coal production. Therefore, any changes in Indonesia's government policies regarding coal commodities will significantly impact these countries. If Indonesia were to halt its exports, it would disrupt the industrialization process in those countries. However, coal producers and users face the challenge of climate change and environmental damage from coal industry development.

Coal remains the only viable option for critical industries with affordable energy options in many markets. Coal is considered essential as a stable supply of electricity and is vital in developing renewable energy infrastructure. The world's top five coal-importing countries continue fulfilling their domestic coal supply by sourcing Indonesian imports. The Philippines relies on 98% of its total coal demand from Indonesian coal imports, averaging 25.41 million tons per year. Furthermore, India is now one of the leading export destinations for Indonesian coal, with average exports of 96.94 million tons per year. China also relies on the Indonesian coal import market and Indonesia is the leading market for Chinese coal imports. More than 62% of China's coal imports come from Indonesia, with an average of 127.86 million tons per year. Meanwhile, Japan relies on 60% of its coal imports from Australia. Similarly, South Korea has Australia as its leading supplier of coal imports, averaging 44.2% of Seoul's total coal, followed by Russia and Indonesia. It can be seen that of the five largest coal importers in the world, three of them depend on Indonesian coal exports for their coal supply. Without Indonesia's coal supply, the country's industrialization process would be disrupted. This means that the role of Indonesian coal is significant in the national energy sectors of importing countries and plays a vital role in global energy contribution.

The research suggests that the Indonesian government should be involved in the political economy of countries dependent on coal from Indonesia. Furthermore, the government should promote domestic coal downstream to meet society's increasing energy needs and address the threat of global resource and energy competition.

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## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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# Study on the Liability Structure and Profitability of the Banking Industry in the Asia-Pacific Region

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**Abstract:** *This study investigates the relationship between the profitability and liability structure of commercial banks within six Asia-Pacific countries (China, India, Australia, Japan, South Korea, and Singapore), by analyzing annual data from BankFocus for 691 banks from 2013 to 2022. The central focus of this research is to explore the impact of banks' liability structure - highlighting passive liabilities, interbank borrowing, and bond issuance - on critical profitability indicators, specifically Return on Equity (ROE) and Tier 1 Ratio (T1R). This research employs panel data analysis alongside Hausman-tested. Our findings discover the roles that passive liabilities and bond issuance play in strengthening banks' core capital and enhancing profitability. Additionally, the impact of bank deposit and borrowing services on profitability and capital across developed and developing nations within the Asia-Pacific region. The study offers practical suggestions for the banking sector, emphasizing the need for improved liability management to boost profitability. These recommendations, backed by thorough empirical research and robustness checks, provide a solid foundation for strategic policy and planning in the sector.*

**Keywords:** liability structure; commercial bank profitability; return on equity; tier 1 capital ratio; heterogeneity analys.

**JEL Classification:** G21; G28; G32; R11.

## Introduction

In the dynamic financial landscape characterized by fluctuating interest rates and economic downturns, commercial banks, particularly in the Asia-Pacific region, play a pivotal role as essential financial intermediaries with sophisticated credit mediation capabilities (Ahanaf, Saima, Zobayer, Sipahi, and Kalam 2023). The development and critical characteristics of the banking sector are crucial to understanding the substantial economic growth of the Asia-Pacific region in the global economy (Antao and Karnik 2022). This region showcases economic diversification, with developed economies like Japan, South Korea, Singapore, and Australia on one end and emerging economies with controlled banking systems like China and India on the other. Commercial banks in the Asia-Pacific economic sphere face challenges, particularly in their asset-liability structure, which influences business management, risk management, and profitability. The structure of liabilities, fundamental to the operation of commercial banks, indicates the banks' funding sources and stability, thus significantly impacting their profits (Vo and Nguyen 2021). These institutions have encountered unprecedented risks due to international economic fluctuations, affecting their development and asset and liability structures. Consequently, a sensible capital structure is pivotal for improving commercial banks' operational conditions and profitability.

Historically, scholarly research acknowledges the influence of banks' passive liabilities, interbank borrowing, and bond issuance structure on their profitability and capital structure. For instance, Brock and Rojas-Suarez (2015) analyzed five Latin American countries in the 1990s using empirical techniques, highlighting how capital/assets, operational expenses/assets, and liquidity of short-term assets/total deposits play into bank interest income and impact profitability through the asset-liability structure. Similarly, Berger and Bouwman (2013) underscored the necessity of capital for small and medium-sized commercial banks to survive crises and recover swiftly. Altunbaş, Thornton, and Uymaz (2018) revealed that commercial banks with larger debt-to-asset ratios hold more value, even when their capital originates from deposits. This notion was further supported by Uchida and Satake (2009), who found that a higher proportion of deposit liabilities in the debt structure enhances cost efficiency for Japanese commercial banks.

Despite the valuable insights from existing research on bank liability structures, gaps remain. Limited studies address how liability arrangements influence banks in specific Asia-Pacific countries like Central Japan, South Korea, India, Singapore, and Australia and how factors beyond liquidity affect bank profitability and capital structure. Examining the effects of active and passive liabilities on the capital structure and profitability of the banking sector in two Asia-Pacific economies, this study seeks to fill these voids. It also investigates the moderating effect of bank liquidity on this relationship, answering the following research questions: (1) The influence of passive liabilities on capital structure and profitability; (2) The impact of interbank borrowing levels; (3) The influence of bond issuance structure; and (4) The moderating effect of bank liquidity on the variables above' effects.

This study substantially adds to the literature by investigating the causes and effects of active and passive liabilities on the APAC banking sector. It employs theoretical and empirical research from the financial markets to determine the impact of active and passive liabilities on bank capital structure and profitability. Commercial banks' risk management and operational decision-making can significantly benefit from the insights obtained. Furthermore, this study aids academics and practitioners in comprehending the relationship between bank liquidity and liability structure and elucidates how bank liquidity modulates profitability and capital adequacy. Specifically, this research addresses a critical gap in understanding how different liability management strategies impact the financial stability and performance of banks in the APAC region, a topic that has received limited attention despite its significant implications for the banking industry's resilience against financial crises and its ability to support regional economic growth.

## 1. Literature Review

In the Asia-Pacific's dynamic and diverse economic landscape, the banking sector's robust development is pivotal (Naiwei Chen, Hsin-Yu Liang and Min-Teh Yu, 2018). Understanding the issues that affect regional bank profitability and capital formation is essential for sound banking development. To explore the intricate relationship between commercial banks' liability structure and profitability, we analyse their liability structure and profitability indicators and constructs models to provide comprehensive insights. The liability framework of state-controlled commercial banks has traditionally been heavily reliant on deposits, with customer contributions driving passive liabilities. The cost of debt for these institutions, dependent on their liability structure, directly influences profitability (Han, 2023). Interest expenses in the liability cost structure are variable, contrasting with more static operational costs. Deposit growth is known to reduce operational costs, and some analysts believe banks with a higher deposit-fund ratio have better capital flow, enabling them to weather tough times effectively.

Significant literature demonstrates the impact of liability structures on the stability and profitability of commercial banks. Ratnoski and Huang (2009) observed that Canadian banks boast a high deposit assimilation rate and do not rely heavily on non-deposit routes, emphasizing that maintaining a reasonable deposit level benefits commercial banks' stability and liquidity. This notion is echoed in findings that banks with a reputation for deposit reliance are more resilient during financial turmoil, with their stock values recovering rapidly, as Raddatz (2010) noted. On the other hand, Lopez-Espinosa *et al.* (2012) warned that balancing short-term financial instruments can lead to fund asset misalignment, potentially reducing bank profitability if the liability structure is not effectively controlled.

In the context of Asia-Pacific economies, the heavy reliance on deposits makes banks particularly vulnerable after economic shocks, lacking significant risk mitigation capabilities. However, Dagher and Kazimov (2012) observed that commercial banks focusing on non-deposit operations, due to their less stable resource base and higher risks, are worse prepared to weather a crisis. The research community generally agrees that passive liabilities, interbank borrowing, and bond issuance structure affect banks' profitability and capital structure. For instance, Berger and Bouwman (2013) stressed the necessity of capital for small and medium-sized commercial banks to survive crises and recover rapidly, a sentiment supported by Lepetit *et al.* (2008) who found that light-asset initiatives increase operational risks.

Empirical analysis and techniques have been employed to study the liability structure and its impact on profitability. Brock and Rojas-Suarez (2015) analyzed Latin American countries in the 1990s, focusing on how capital/assets, operational expenses/assets, and liquidity of short-term assets/total deposits impact bank interest income and the asset-liability structure's influence on profitability. Wang Hongli (2011) examined the effect of asset-liability structure on profitability among commercial banks, highlighting the direct impact of the asset-liability ratio, loan-to-deposit ratio, and asset magnitude on profitability. Han Bing (2014) delved into commercial banks' asset and liability management, focusing on the net interest margin and observing that commercial banks have a homogenized asset and liability structure, with state-owned organizations exhibiting a high deposit-to-loan ratio.

Asia-Pacific nations' various financial systems and phases of economic development highlight the region's economic diversity. Developed economies such as Japan, South Korea, Singapore, and Australia differ from emerging economies such as China and India, which have controlled financial systems. The divergent effects of liability structures on commercial banks in these nations are an indication of this diversity. Li and Zhu (2007) study divided liabilities into three groups: inactive, active, and settlement. They found that interbank loans, deposits, central bank loans, repurchase agreements, and certificates of deposit were the most common types of active liabilities.

Notwithstanding the significant contributions made by prior studies regarding bank liability structures, certain knowledge voids persist, specifically regarding the impact of liability arrangements on banks in Asia-Pacific nations such as Australia, Central Japan, South Korea, India, and Singapore. Also, we need to learn more about how things other than liquidity affect a bank's ability to make money and keep its capital. This study intends to fill these gaps by investigating the effects of active and passive liabilities on the profitability and capital structure of the banking sector in two economies in the Asia-Pacific region, as well as the role that bank liquidity plays in mediating this relationship.

Consumer deposits, which are the primary passive liabilities of banks, are frequently mentioned in the literature. State-owned commercial banks have a significant ability to absorb deposits, according to Hu Chaoxia and Chen Langnan (2004), whereas Uchida and Satake (2009) discovered that more deposit absorption enhances cost control. These data provide evidence in favor of Hypothesis 1.1, which states that passive liabilities, such as deposits from customers, contribute to an increase in the profitability of banks. According to research by Zhang and Zeng (2014), joint-stock commercial banks in the Asia-Pacific area have a more varied liability business and a stronger emphasis on funding sources than state-owned big banks. These commercial banks also have a sizable passive liability portfolio.

On the contrary, Dagher and Kazimov (2012) observed that commercial banks specializing in non-deposit operations were less equipped to withstand a crisis, owing to their less stable resource base and increased risks. As a result, we are more equipped to grasp the complexities of commercial banks' liability structures and how they affect profitability and capital sufficiency.

There is widespread agreement among academics that the structures of bond issuance, interbank borrowings, and passive liabilities have a major impact on the capital structure and profitability of banks. Berger and Bouwman (2013) analyzed commercial banks for 25 years and found that capital helps them weather crises and recover quickly. The findings of Lepetit *et al.* (2008) from an analysis of European commercial banks further accentuate the risk factors, indicating that light-asset initiatives elevate operational risks.

Commercial banks have also been shown to value debt structures with a higher proportion of deposit liabilities, as Uchida and Satake (2009) found that this structure enhances cost efficiency in Japanese commercial banks. Mendes (2001) examined profitability factors in commercial banks across several European countries, finding a substantial link between bank net asset return rates and a set of financial and market indicators.

Based on the literature review mentioned earlier, we establish the following hypotheses:

Hypothesis 1: Within the Asia-Pacific economic area, the development of the banking sector will be influenced to different extents by the composition of liabilities, affecting both profitability and capital structure of the banks.

Hypothesis 1.1: The level of passive liabilities in banks will positively impact profitability and strengthen the institutions' core capital.

Hypothesis 1.2: The level of interbank borrowing of banks have a detrimental effect on profitability, but will not significantly alter the banks' fundamental capital.

Hypothesis 1.3: The structure of bond issuance by banks will positively impact on profitability and will also improve the banks' capital structure.

Additionally, it delves into the moderating effect of bank liquidity on this correlation, raising inquiries regarding the effects of passive liabilities, levels of interbank borrowing, the structure of bond issuance, and the function of bank liquidity within the liability structure as it relates to the profitability and capital adequacy metrics.

Deposit liabilities and non-deposit liabilities make up most of a bank's liabilities. Deposit liabilities, especially core accounts, don't have a big effect on the bank's cash flow, even though they are very stable (Li 2023). In this way, how banks handle their liquidity is a key part of changing their risk structure and making sure they keep their profits and capital levels (Zhang 2022). By enhancing the efficiency of liquidity management, banks are able to maintain a stable cost of liabilities and a reasonable liability maturity structure when experiencing deposit withdrawal pressure, mitigating the potential negative impact of deposit liabilities on profitability and capital adequacy.

Banks utilize the interbank lending market as a crucial instrument for the management of short-term liquidity (Chen 2022). However, excessive dependence on interbank lending could potentially impair banks' profitability, particularly during market tightness periods. By reducing their dependence on high-cost interbank borrowing and enhancing their ability to manage maturity pressures on short-term liabilities, banks can sustain profitability with the assistance of a substantial level of liquidity. Enhanced liquidity serves to both diminish dependence on interbank borrowing and improve the efficiency of bank bond issuance.

Firstly, Liang (2015) and Liu (2017) emphasise that by enhancing liquidity, banks are able to manage their liability structure more effectively, thereby improving not only profitability but also capital adequacy. In addition, Brock & Rojas-Suarez (2015) further confirmed that increasing the ratio of liquid short-term assets can effectively mitigate the potential negative impact of asset-liability structure on profitability by analysing key indicators such as capital/assets, operating expenses/assets, and liquid short-term assets/total deposits.

Meanwhile, Chen (2014) points out that although a reduction in the deposit financing ratio may have a negative impact on banks' profitability and risk, banks can effectively mitigate these negative impacts through enhanced liquidity management and consequently improve profitability and risk management capabilities. Further, Chen, Yihong (2016) reminds us that although non-deposit liabilities are more volatile and vulnerable to negative information compared to deposit liabilities, banks can significantly reduce this volatility and mitigate liquidity risk triggered by short-term wholesale capital flight through enhanced liquidity management, thereby improving profitability and capital structure.

In addition, Yang and Ou (2007) point out that commercial banks can achieve higher liquidity levels through effective management of interbank lending, which not only helps to mitigate liquidity volatility caused by liability fluctuations, but also alleviates, to some extent, pressures on profitability and capital adequacy induced by inappropriate liability structures. Meanwhile, Miao and Yin (2017) emphasise that although an increase in the share of interbank liabilities may bring about maturity mismatches and liquidity risks, these risks can be effectively controlled by increasing bank liquidity, thus optimising banks' asset-liability structure and meeting interbank liquidity needs. Ratnoski and Huang (2009) also argue that although insufficient liquidity reserves can jeopardise the safety of banks, maintaining a certain level of liquidity can mitigate the negative impact of interbank lending and further enhance the stability and liquidity of banks. Research by Ouyang (2007) and Lian (2013) underscored the impact of liability structure on bank liquidity and the critical importance of liquidity to banking operations. Although these studies do not directly address the moderating role of liquidity on the relationship between liability structure and profitability/capital adequacy, they provide a backdrop for the role of liquidity in bank liability structures, lending support to Hypothesis 2. Studies by Rajan (2006), Ratnoski and Huang (2009), and Ivashina and Scharfstein (2010) indicate that the composition of liabilities, particularly the reliance on non-deposit liabilities which are considered less liquid, can significantly affect a bank's liquidity, thereby impacting its profitability and capital adequacy.

Finally, Peng and Tong (2013) observe that the interbank lending market may lead to the proliferation of liquidity risk when faced with large fluctuations, but banks can effectively mitigate the proliferation of such risk by enhancing their liquidity management and reserves, maintaining the stability of their trading volume, and mitigating the negative impact of liquidity risk on profitability and capital structure. In a similar vein, Xu, Li, and Yang (2013) stress that banks can lessen the negative effects of liquidity risk on capital structure and profitability by implementing effective risk control and management strategies, even though concentration and interbank business operations can make banks more vulnerable to this risk. Liu (2017) and Liang (2015) found a strong correlation between liquidity risk and interbank liabilities, showing that liquidity can really mitigate the effect of liability structure on capital adequacy and profitability. This literature provides strong evidence that banks' liquidity is important for their stability and efficiency, and that banks can regulate their liability structure, increase profitability, and optimize capital adequacy through better liquidity management.

Improving a bank's liquidity has far-reaching effects on its obligation structure, particularly with regard to passive liabilities (Chen, 2022). Given banks' inability to control the quantity and terms of customer deposits, the instability of deposit liabilities can lead to liquidity stress (Zhang 2022). Nonetheless, the increase in the proportion of core deposits, being a stable source of funds, can relatively reduce liquidity risks, thereby strengthening the bank's profitability and stabilizing its capital structure. Moreover, non-deposit liabilities, such as bond issuances, interbank liabilities, and other financial liabilities, offer more flexible responses to market conditions and enhance banks' liquidity management. However, this also means that an over-reliance on non-deposit liabilities may increase liquidity pressure in adverse market conditions, negatively impacting the bank's profitability and capital structure.

Drawing upon the aforementioned literature review, we proceed to develop the hypothesis 2.

Hypothesis 2: The liquidity of banks can modulate the impact of liability structure on profitability and capital adequacy.

This review underscores the significance of a nuanced understanding of liability structures, liquidity management, and their interplay in shaping the profitability and capital adequacy of commercial banks in the Asia-Pacific region. It sets the stage for further empirical analysis and robustness testing, aiming to provide insights that can inform industry regulation reforms. The literature, however, acknowledges gaps in understanding how liability structures impact banks, particularly in Central Japan, South Korea, India, Singapore, and Australia, and how factors beyond liquidity influence bank profitability and capital structure.

This study aims to bridge these gaps by scrutinizing how active and passive liabilities affect the banking sector's profitability and capital structure in two Asia-Pacific economies. It also explores the moderating role of bank liquidity in this relationship, posing research questions about the impact of passive liabilities, interbank borrowing levels, bond issuance structure, and the role of bank liquidity in the liability structure's influence on profitability and capital adequacy.

## 2. Methodology

Focusing on the impact of banks' liability structure on their profitability and core capital adequacy, this study concentrates on the components of bank liabilities, categorized into passive liabilities, interbank borrowing, and bond issuance (Bian 2015). The ratio of active liabilities (interbank borrowing), bond issuance, and passive liabilities is chosen as the key explanatory variable. For profitability metrics, this study adopts Net Asset Return (ROE) and core capital adequacy (T1R) as the primary indicators. The dynamics of liability structure, including the relationship between passive liabilities, and bond issuance ratios, are thoroughly examined to understand their impact on commercial bank profitability and the bank's core capital within developed countries (Australia, Japan, South Korea, Singapore) and developing countries (China, India) in the Asia-Pacific region.

### Independent Variables

This study mainly studies the impact of the bank's liability structure on profitability, focusing on the composition of bank liabilities in the balance sheet. Therefore, this study selects three items based on the data from the bank's financial statements in bankfocus database: "Personal and Corporate Deposits," "Bank Deposits," and "Issued Bonds and Reverse Repos" reflecting a comprehensive approach to analyzing bank liabilities. Passive Liability Ratio (depor) represents the ratio of personal and corporate deposits to total liabilities. Personal and corporate deposits are a fundamental aspect of a bank's funding, reflecting the bank's ability to attract and retain customer deposits. Interbank Borrowing Rate is indicative of the bank's reliance on interbank markets for short-term funding, which can have implications for liquidity management and risk exposure. The Bond Issuance Ratio (dbondr) captures the proportion of funding derived from issued bonds and reverse repos to total liabilities. Furthermore, the proportion of these three items—passive liability ratio, interbank borrowing rate, and bond issuance ratio—to the total liabilities is utilized as proxy variables, a method supported by Ratnoski & Huang (2009) and further substantiated by recent research from Feng (2022). The selection of these variables is predicated on the hypothesis that the composition and cost of liabilities are crucial to a bank's financial health and operational efficiency, thereby influencing its profitability. This hypothesis is corroborated by the empirical findings of Feng (2022), which echo the significance of these liability components in determining banking profitability.

### Dependent Variables

The selection of dependent variables mainly takes into account the profitability and capital structure of banks. The main variables selected here are the return on equity (ROE) to measure profitability and the Tier 1 capital ratio (T1R) to measure capital structure. It is noteworthy that in terms of measuring profitability, this study does not consider the use of non-interest income rate or other related indicators of earnings quality that are typical in banking measures but adopts the more traditional net asset return rate. The ability of various liabilities of commercial banks, represented by deposits, to generate revenue should not be overlooked, so ROE performs better in reflecting bank profitability. Therefore, following the research ideas of Han (2023), this study also selects ROE as the indicator for measuring bank profitability.

### Moderating Variables

In the selection of moderating variables, this study uses the loan-to-deposit ratio as the moderating variable. The nature of this indicator is, in fact, similar to the current ratio of general enterprises. Since the primary indicators for measuring the liquidity of banks are based on the short-term match between the bank's operational liabilities and assets, the loan-to-deposit ratio is often used to measure the level of liquidity risk of banks. Consistent with this approach, Demirgüç-Kunt and Huizinga (2010) demonstrate that loan-to-deposit ratios is a critical determinant of banks' risk-bearing capacity and profitability. Similarly, Berger and Bouwman (2013) highlight the importance of the loan-to-deposit ratio in bank liquidity creation and its impact on bank stability and economic resilience. These studies underscore the loan-to-deposit ratio's relevance as a moderating variable, affirming its utility in evaluating the liquidity risk and operational stability of banks within the financial sector.

### Control Variables

Regarding the selection of control variables, since the data collected in the subsequent model design mainly comes from micro-level data of listed and unlisted banks. Hence, unlike some existing research based on listed banks that extract macro data as control variables and conduct analyses with methods like GMM, to avoid the impact of multicollinearity on fixed effects, this study mainly bases its control variables on micro-level data of the banking industry. control variables include: Leverage Ratio (lev), Non-Interest Income Proportion (niir),Fixed Asset Ratio (ol),Liquidity Ratio (liqui),Growth Rate (growth),Loan Loss Provision Rate (llr).

Moreover, due to the significant differences in the number and scale of banks among countries, as well as substantial variations in the structure, types, and their impact on the domestic economy, different approaches are needed. For example, in domestic banks in China, state-owned banks and joint-stock banks usually have larger scales but are very few in number, a situation also seen in countries like India and Australia. In addition, given the difference in the number of banks among countries but considering the capital scale of banks as an important aspect in the weight of model regression, this study uses the average total asset size in the survey year as a weighted variable to rationally plan the regression results of the model.

For specific variable definitions, please refer to Table 1.

Furthermore, this study filters and collects data from domestic banks that are currently in operation through the Bank Focus platform. It has obtained financial data of the domestic banking industry from 2013 to 2022 and has constructed the dataset required for the empirical model. The specific operations are as follows: On the BankFocus platform, banks labeled as "active" or "unknown" and located in "China," "Japan," "South Korea," "Singapore," "Australia," and "India" were searched, and their financial data from 2013 to 2022 was collected. After obtaining the relevant data, descriptive statistics were performed on the financial data, and samples with excessive skewness, kurtosis, and numerous outliers were trimmed by 1% from both tails.

Table 1. Variables and Definitions

| | Variable Name | Symbol | Measurement Proxies |
|---|---|---|---|
| Dependent Variable | Return on Equity (ROE) | Roe | Return on Equity |
| | Capital Adequacy Ratio | t1r | t1r=Tier 1 Capita / Risk-Weighted Assets |
| Independent Variables | Passive Liability Ratio | depor | The ratio of personal and corporate deposits to total liabilities. |
| | Interbank Borrowing Rate | dbankr | The proportion of funds a bank borrows from other banks relative to its total liabilities. |
| | Bond Issuance Ratio | dbondr | The proportion of funding that comes from issued bonds and reverse repos to total liabilities. |
| Control Variables | Leverage Ratio | lev | Lev= total Assets /total Liabilities |
| | Asset Growth Rate | Growth | Growth = the average total asset size |
| | Non-Interest Income Ratio | niir | Niir=Non-Interest Income/Total Income |
| | Fixed Asset Ratio | ol | Ol=Total Assets/ Fixed Assets |
| | Loan Loss Reserves (LLR) | llr | llr=Loan Loss Reserve / total loan |
| | Liquidity Ratio | liqui | Liqui= Current assets / Current liabilities |
| Moderating Variable | Loan-to-deposit ratio Ratio | liqui | dlr= Total Deposits/Total Loans |

*Source*: Authors' computations based on data from BankFocus

On the basis of the above processing, observation samples with incomplete variable parts were excluded to obtain the final dataset for the empirical model. In summary, this study obtained 4,469 observational samples from 691 banking enterprises across six countries. The descriptive statistics are specifically presented in Table 2 as follows:

Table 2. Descriptive Analysis

| Variable | Obs. | Mean | Std. dev. | Min | Max | Skewness | Kurtosis |
|---|---|---|---|---|---|---|---|
| roe | 4469 | 5.917 | 6.53 | -67.648 | 37.561 | -1.505 | 17.746 |
| t1r | 4469 | 13.632 | 8.428 | 6.55 | 136 | 8.748 | 113.804 |
| depor | 4469 | .838 | .3 | 0 | 1.328 | -1.604 | 5.098 |
| dbankr | 4469 | .076 | .118 | 0 | .99 | 1.846 | 7.008 |
| dbondr | 4469 | .016 | .031 | 0 | .274 | 2.825 | 13.44 |
| dlr | 4469 | 1.494 | 12.05 | .034 | 233.992 | 18.117 | 343.925 |
| ol | 4469 | .009 | .008 | 0 | .105 | 2.775 | 20.157 |
| lev | 4469 | 92.501 | 4.299 | 12.987 | 98.012 | -6.794 | 89.77 |
| llr | 4469 | 2.175 | 2.728 | 0 | 59.13 | 9.267 | 154.694 |
| liqui | 4469 | 25.208 | 13.409 | .098 | 82.686 | .734 | 3.606 |
| niir | 4469 | .186 | .254 | -.134 | 1 | 2.189 | 7.357 |
| growth | 4469 | .078 | .19 | -.618 | 9.1 | 28.915 | 1260.853 |
| roe | 4469 | 5.917 | 6.53 | -67.648 | 37.561 | -1.505 | 17.746 |

*Source*: Authors' computations based on data from BankFocus

From the results obtained, we gain valuable insights into banks' characteristics and risk profiles in different countries. These insights are critical for understanding the relationship between internal governance and risk levels in banks.

Banks generally exhibit high leverage ratios due to the nature of their primary business operations, which are primarily centered around deposits and loans. The debt side of their balance sheets, comprising deposits, interbank borrowing, bond issuance, and other adequate financial liabilities, forms the crux of their profit-generating activities. The mean value of the non-interest income ratio (niir) is observed to be 0.186, indicating that, on average, non-interest income accounts for approximately 18.6% of the total income across all bank samples. The result indicates a significant reliance of certain banks on non-traditional banking services for revenue generation.The significant skewness and kurtosis of the distribution suggest approximately 50% of the bank's total assets are risk-weighted, with some banks bearing considerably higher risks. This result reflects the varying degrees of risk exposure across different banks. Banks tend to have a relatively low proportion of fixed assets. This is likely due to their primary focus on service-oriented operations, which require less infrastructure than other business types. The average loan-to-deposit ratio is about 1.49 times, illustrating the relationship between the banks' liabilities (deposits) and their assets (loans). The average level of LLR is around 2.17%, indicative of the banks' preparedness for potential loan losses. The non-performing loan rate is at an average, which indicates the level of loan recovery risk the banks face. The capital adequacy average ratio is 13%, demonstrating the banks' capacity to withstand financial risks. The average ROE lies between 5% and 6%, showing the profitability level of these banks.

The study includes bank samples from six countries: Australia (AU), China (CN), India (IN), Japan (JP), South Korea (KR), and Singapore (SG) to conduct a more detailed analysis and comparison of the risk and governance characteristics of banks in different countries. The specific distribution of samples for various banks can be referred to in the following Table 3:

Table 3. Sample Distribution

| Year/Sample Size | Country | | | | | | |
|---|---|---|---|---|---|---|---|
| | Australia | China | India | Japan | South Korea | Singapore | Total |
| 2013 | 13 | 68 | 21 | 119 | 16 | 4 | 241 |
| 2014 | 14 | 98 | 31 | 146 | 17 | 4 | 310 |
| 2015 | 16 | 112 | 30 | 183 | 17 | 4 | 362 |
| 2016 | 21 | 135 | 42 | 216 | 19 | 5 | 438 |
| 2017 | 36 | 146 | 50 | 246 | 19 | 6 | 503 |
| 2018 | 46 | 158 | 51 | 281 | 22 | 6 | 564 |
| 2019 | 44 | 164 | 52 | 293 | 23 | 6 | 582 |
| 2020 | 42 | 165 | 53 | 302 | 25 | 5 | 592 |
| 2021 | 41 | 168 | 60 | 300 | 25 | 5 | 599 |
| 2022 | 41 | 170 | 35 | 1 | 25 | 6 | 278 |
| N | 314 | 1384 | 425 | 2087 | 208 | 51 | 4469 |
| No. of Entities | 56 | 212 | 71 | 320 | 25 | 7 | 161 |

*Source*: Authors' computations based on data from BankFocus

These small-scale banks have become the primary financial entities in these countries. However, in subsequent model regressions, it is necessary to pay attention to the issue that the results may be biased towards private small banks due to the over-representation of small-scale bank samples. Therefore, size will be used as a weighting factor for adjustment in subsequent analyses.

Before the empirical model analysis, this study first conducted Hausman test and fixed effect F-test based on the model selection, and the specific results are as follows in Table 4A and Table 4B.

Table 4A. Hausmen Test for ROA

| Variable | Hausman Test | F-test | P-value |
|---|---|---|---|
| depor | 773.62 | 17.55 | 0.0000 |
| dbankr | 551.29 | 15.19 | 0.0000 |
| dbondr | 515.68 | 15.34 | 0.0000 |

*Source*: Authors' computations based on data from BankFocus

Table 4B. Hausmen Test for T1R

| Variable | Hausman Test | F-test | P-value |
|---|---|---|---|
| depor | 426.67 | 12.60 | 0.0000 |
| dbankr | 380.55 | 12.56 | 0.0000 |
| dbondr | 402.18 | 14.34 | 0.0000 |

*Source*: Authors' computations based on data from BankFocus

In light of the significant findings from our Hausman and F-tests, indicating a preference for the fixed effects model, we integrate the Heckman second-step model to further refine our analysis. This critical step corrects for selection bias inherent in our dataset by utilizing a lambda correction factor derived from the first-step selection model. By doing so, we ensure that our estimates, whether related to ROA or T1R, are not merely a reflection of sample selection biases but are instead robust representations of the true underlying relationships between bank performance indicators and their determinants. This methodological enhancement is pivotal for drawing more accurate and generalizable conclusions from our empirical investigation. From the results, it can be observed that both the Hausman test and the F-test are significant, hence a fixed-effect model is adopted. Based on the above results, the following fixed-effect model formula can be derived.

Equation1：

$$Roe_{it} = \beta_0 + \beta_1 dratio_{it} + \sum control_{it} + u_i + \mu_t + \varepsilon_{it} \quad (1)$$

Equation 2：

$$t1r_{it} = \beta_0 + \beta_1 dratio_{it} + \sum control_{it} + u_i + \mu_t + \varepsilon_{it} \quad (2)$$

## 3. Research Results

### I. Regression Analysis

Regression analysis is conducted for Model (1), Model (2), to test the research hypotheses. In this section of the study, we present the main empirical findings derived from the fixed effects model and offer a detailed interpretation and analysis of these results. The empirical model results for Hypothesis 1 are detailed in Table 5.

Table 5. Hypothesis 1

| | (1)<br>roe | (2)<br>t1r | (3)<br>roe | (4)<br>t1r | (5)<br>roe | (6)<br>t1r |
|---|---|---|---|---|---|---|
| main | | | | | | |
| depor | 0.856*** | 1.428*** | | | | |
| | (2.43) | (3.06) | | | | |
| dbankr | | | -2.406** | 7.921*** | | |
| | | | (-2.02) | (8.76) | | |
| dbondr | | | | | 11.74*** | 8.140*** |
| | | | | | (3.91) | (3.53) |
| ol | -32.10*** | -133.0*** | -37.72*** | -130.2*** | -33.05*** | -137.0*** |
| | (-3.05) | (-15.95) | (-3.64) | (-16.01) | (-3.22) | (-16.80) |
| lev | 0.202*** | -1.590*** | 0.197*** | -1.587*** | 0.191*** | -1.600*** |
| | (8.39) | (-83.01) | (8.20) | (-83.71) | (7.93) | (-83.47) |
| llr | 0.00982 | 0.780*** | -0.00170 | 0.803*** | 0.00994 | 0.777*** |
| | (0.29) | (28.94) | (-0.05) | (29.88) | (0.30) | (28.96) |
| liqui | -0.0449*** | 0.0636*** | -0.0409*** | 0.0573*** | -0.0484*** | 0.0628*** |
| | (-6.56) | (11.70) | (-5.94) | (10.60) | (-7.04) | (11.55) |
| niir | 1.611** | 2.578*** | 1.911*** | 2.456*** | 1.212* | 2.488*** |
| | (2.53) | (5.15) | (3.04) | (5.04) | (1.89) | (4.95) |
| growth | 3.092*** | 1.320** | 3.311*** | 0.992 | 2.882*** | 1.222* |
| | (3.67) | (1.99) | (3.93) | (1.50) | (3.42) | (1.83) |
| _cons | -10.61*** | 160.5*** | -10.48*** | 160.1*** | -9.203*** | 161.4*** |
| | (-4.51) | (85.60) | (-4.45) | (86.22) | (-3.87) | (85.25) |
| N | 4469 | 4469 | 4469 | 4469 | 4469 | 4469 |
| chi2 | 1271.4 | 11587.3 | 1279.8 | 11879.9 | 1285.8 | 11638.9 |
| p | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| LR-rho | 143.30*** | 316.77*** | 149.49*** | 320.58*** | 145.35*** | 317.72*** |

Note: T-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1. roe: Return on Equity; t1r: Tier 1 Capital Ratio, calculated as Tier 1 Capital / Risk-Weighted Assets; depor: The ratio of personal and corporate deposits to total liabilities; dbankr: The proportion of funds a bank borrows from other banks relative to its total liabilities; dbondr: The proportion of funding that comes from issued bonds and reverse repos to total liabilities; ol: Leverage, calculated as Total Assets / Fixed Assets; lev: Leverage ratio, calculated as Total Assets / Total Liabilities; llr: Loan Loss Reserve / Total Loan; Liqui= Current assets / Current liabilities; niir: Non-Interest Income Ratio, calculated as Non-Interest Income / Total Income; growth: The average total asset growth rate.

*Source*: Authors' computations based on data from BankFocus

From the results of the Heckman second-step model, the verification of hypothesis 1.1 is still significantly observable. In contrast, for the verification of hypothesis 1.2, it is found that interbank borrowing actually improves the structure of core assets. This result is reasonably justified from the perspective of the bank's business development—as bank borrowing is inherently based on business-oriented capital flows, which can reduce the cost of business operations to a certain extent, thereby more effectively aggregating capital. In terms of verifying hypothesis 1.3, it is firstly observable that issuing bonds effectively enhances the bank's core capital accumulation and also positively impacts the bank's profitability. Therefore, hypothesis 1.3 is also validated. Supporting these findings, the study conducted by Feng (2022) on 19 listed commercial banks in China from 2011 to 2020 demonstrates a positive correlation between passive debt structure and commercial bank profitability, with no significant relationship observed between active debt structure and profitability. This aligns with our conclusion that bond issuance significantly strengthens banks' core capital accumulation and positively affects their profitability, highlighting the beneficial role of passive debt structure in enhancing commercial bank profitability. Similarly, research by Zemenu A. A., and David M. (2021) within the context of private banks in Ethiopia found that passive liabilities, including bond issuance, positively influence profitability, corroborating the significance of passive debt structure in boosting bank profitability. Furthermore, Rastogi *et al.* (2022) provide a systematic literature review on banking regulation, profitability, and risk, proposing a model that guides the optimal mix of these variables. Their model suggests that a well-structured bond issuance strategy not only positively impacts bank profitability but also contributes to strengthening the bank's capital structure. This finding echoes our conclusion, underscoring the critical role of bond issuance in both enhancing bank profitability and core capital accumulation. These corroborative studies from the literature offer additional validation to our analysis, emphasizing the crucial impact of debt structure, particularly passive liabilities and bond issuance, on the profitability and capital accumulation strategies of commercial banks.

The results for the testing of Hypothesis 2 are presented in Table 6.

Table 6. Hypothesis 2

| | (1)<br>roe | (2)<br>t1r | (3)<br>roe | (4)<br>t1r | (5)<br>roe | (6)<br>t1r |
|---|---|---|---|---|---|---|
| dlr | -0.0389** | -0.00422 | -0.0137 | 0.00873 | -0.0184 | 0.00338 |
| | (-1.98) | (-0.55) | (-0.65) | (1.05) | (-0.90) | (0.42) |
| depor | 11.30*** | 6.371*** | | | | |
| | (13.25) | (19.17) | | | | |
| depor*dlr | -16.20*** | -5.818*** | | | | |
| | (-16.68) | (-15.38) | | | | |
| dbankr | | | -11.20*** | 0.0744 | | |
| | | | (-9.49) | (0.16) | | |
| dbank*dlr | | | -0.0589 | -0.225*** | | |
| | | | (-0.44) | (-4.20) | | |
| dbondr | | | | | -4.674 | 8.872*** |
| | | | | | (-0.99) | (4.80) |
| dbond*dlr | | | | | 0.824 | -12.12*** |
| | | | | | (0.16) | (-5.87) |
| ol | -5.790 | -42.52*** | -17.71 | -34.51*** | -6.690 | -35.93*** |
| | (-0.36) | (-6.76) | (-1.07) | (-5.24) | (-0.40) | (-5.48) |
| lev | 0.715*** | -0.948*** | 1.163*** | -0.794*** | 1.134*** | -0.811*** |
| | (10.88) | (-37.04) | (18.65) | (-31.98) | (17.90) | (-32.58) |
| llr | -1.687*** | -0.186*** | -1.713*** | -0.208*** | -1.693*** | -0.209*** |
| | (-22.31) | (-6.31) | (-22.08) | (-6.72) | (-21.55) | (-6.76) |
| liqui | -0.0526*** | 0.0187*** | 0.0201** | 0.0460*** | 0.0305*** | 0.0410*** |
| | (-4.85) | (4.44) | (2.01) | (11.55) | (2.90) | (9.90) |
| niir | 8.524*** | -1.895*** | 7.925*** | -2.245*** | 8.590*** | -2.220*** |
| | (9.27) | (-5.29) | (8.42) | (-5.99) | (9.02) | (-5.94) |
| growth | 2.618*** | 0.562*** | 2.588*** | 0.255 | 2.376*** | 0.212 |
| | (5.91) | (3.26) | (5.70) | (1.41) | (5.16) | (1.17) |
| _cons | -52.83*** | 100.1*** | -95.83*** | 86.46*** | -95.10*** | 88.12*** |
| | (-8.45) | (41.09) | (-16.70) | (37.82) | (-16.25) | (38.35) |
| N | 4429 | 4429 | 4429 | 4429 | 4429 | 4429 |
| adj. R2 | 0.838 | 0.893 | 0.829 | 0.882 | 0.824 | 0.882 |
| F | 183.4 | 176.9 | 151.6 | 120.8 | 138.0 | 123.1 |
| p | 2.43e-289 | 1.88e-280 | 3.95e-245 | 6.51e-200 | 1.65e-225 | 1.80e-203 |

Note: T-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1.roe: Return on Equity; t1r: Tier 1 Capital Ratio, calculated as Tier 1 Capital / Risk-Weighted Assets; depor: The ratio of personal and corporate deposits to total liabilities; dbankr: The proportion of funds a bank borrows from other banks relative to its total liabilities; dbondr: The proportion of funding that comes from issued bonds and reverse repos to total liabilities; ol: Leverage, calculated as Total Assets / Fixed Assets; lev: Leverage ratio, calculated as Total Assets / Total Liabilities; llr: Loan Loss Reserve / Total Loan; Liqui= Current assets / Current liabilities; niir: Non-Interest Income Ratio, calculated as Non-Interest Income / Total Income; growth: The average total asset growth rate; dlr: Total Deposits/Total Loans.

*Source*: Authors' computations based on data from BankFocus

Firstly, in terms of the impact of deposit operations on the profitability and capital accumulation of banks, it is evident that the loan-to-deposit ratio has a negative moderating effect. In other words, the higher the proportion of loans relative to deposits in banks, resulting in lower liquidity, the smaller the positive effect of bank deposits on profitability and capital accumulation. This aligns with Li (2023) and the corresponding hypothesis posited in this study. Li's research sheds light on the broader implications of liquidity on a bank's operational decisions and risk profile. Li's research highlights that as banks operate with a higher proportion of loans relative to deposits, their liquidity reserves are strained, forcing them to navigate a tighter liquidity situation. This increased reliance on loans can lead to higher profitability in the short term due to the interest income generated but also exposes banks to greater liquidity and operational risks.

However, concerning the influence of interbank borrowing and bond issuance on banks, we can only observe the negative moderating effect of liquidity on their impact on bank capital accumulation. In other words, liquidity is more concentrated in the capital accumulation aspect of banks engaged in non-deposit operations, while it does not substantially affect the mechanism that impacts profitability.

Therefore, Hypothesis 2 is only partially validated, which is consistent with the studies of Zhang (2022) on the role of internal governance in Chinese banks.

**II. Heterogeneity analysis**

This study conducts a country-specific heterogeneity analysis, corresponding to developed Countries such as Japan, South Korea, Singapore, and Australia, and developing countries like China and India, leading to the following results in Table 7A and Table 7B.

Table 7A. Analysis of Banking Systems in China and India

| | (1)<br>roe | (2)<br>t1r | (3)<br>roe | (4)<br>t1r | (5)<br>roe | (6)<br>t1r |
|---|---|---|---|---|---|---|
| depor | 0.735 | -0.573 | | | | |
| | (0.48) | (-1.29) | | | | |
| dbankr | | | -11.38*** | 0.977** | | |
| | | | (-7.45) | (2.18) | | |
| dbondr | | | | | -8.026* | 2.623** |
| | | | | | (-1.85) | (2.10) |
| ol | -92.58** | -61.18*** | -122.1*** | -59.89*** | -94.78** | -61.27*** |
| | (-2.32) | (-5.31) | (-3.11) | (-5.20) | (-2.38) | (-5.34) |
| lev | 0.761*** | -0.970*** | 0.837*** | -0.968*** | 0.748*** | -0.960*** |
| | (6.73) | (-29.81) | (7.69) | (-30.39) | (6.80) | (-30.32) |
| llr | -1.439*** | -0.0470 | -1.460*** | -0.0492* | -1.440*** | -0.0493* |
| | (-14.24) | (-1.61) | (-14.82) | (-1.70) | (-14.36) | (-1.71) |
| liqui | 0.0138 | 0.0294*** | 0.0107 | 0.0297*** | 0.0205 | 0.0272*** |
| | (0.91) | (6.67) | (0.71) | (6.75) | (1.31) | (6.02) |
| niir | 16.77*** | -1.986*** | 15.53*** | -1.829*** | 16.47*** | -1.854*** |
| | (9.51) | (-3.91) | (8.96) | (-3.60) | (9.36) | (-3.66) |
| growth | 3.938*** | 0.925*** | 3.910*** | 0.956*** | 3.927*** | 0.948*** |
| | (5.84) | (4.76) | (5.95) | (4.97) | (5.87) | (4.92) |
| _cons | -55.90*** | 102.0*** | -59.86*** | 101.1*** | -54.07*** | 100.6*** |
| | (-5.17) | (32.75) | (-5.94) | (34.27) | (-5.29) | (34.18) |
| N | 1784 | 1784 | 1784 | 1784 | 1784 | 1784 |
| adj. R2 | 0.792 | 0.915 | 0.799 | 0.916 | 0.792 | 0.916 |
| F | 52.14 | 140.7 | 61.95 | 141.4 | 52.70 | 141.4 |
| p | 8.43e-67 | 1.04e-159 | 1.88e-78 | 2.22e-160 | 1.75e-67 | 2.66e-160 |

Note: T-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1.roe: Return on Equity; t1r: Tier 1 Capital Ratio, calculated as Tier 1 Capital / Risk-Weighted Assets; depor: The ratio of personal and corporate deposits to total liabilities; dbankr: The proportion of funds a bank borrows from other banks relative to its total liabilities; dbondr: The proportion of funding that comes from issued bonds and reverse repos to total liabilities; ol: Leverage, calculated as Total Assets / Fixed Assets; lev: Leverage ratio, calculated as Total Assets / Total Liabilities; llr: Loan Loss Reserve / Total Loan; Liqui= Current assets / Current liabilities; niir: Non-Interest Income Ratio, calculated as Non-Interest Income / Total Income; growth: The average total asset growth rate.

*Source*: Authors' computations based on data from BankFocus

Table 7B. Analysis of Banking Systems in Japan, Korea, Singapore, and Australia

| | (1)<br>roe | (2)<br>t1r | (3)<br>roe | (4)<br>t1r | (5)<br>roe | (6)<br>t1r |
|---|---|---|---|---|---|---|
| depor | 4.705*** | 6.560*** | | | | |
| | (4.13) | (10.64) | | | | |
| dbankr | | | 14.75*** | -7.461*** | | |
| | | | (6.04) | (-5.51) | | |
| dbondr | | | | | 7.245** | -4.331*** |
| | | | | | (2.39) | (-2.58) |
| ol | -20.87 | -42.18*** | -16.69 | -43.74*** | -18.70 | -42.98*** |
| | (-1.47) | (-5.50) | (-1.18) | (-5.59) | (-1.31) | (-5.46) |
| lev | 0.504*** | -0.865*** | 0.543*** | -0.902*** | 0.535*** | -0.899*** |
| | (5.30) | (-16.80) | (5.75) | (-17.23) | (5.62) | (-17.07) |
| llr | -1.200*** | -0.939*** | -0.932*** | -1.134*** | -1.058*** | -1.078*** |
| | (-4.46) | (-6.44) | (-3.46) | (-7.59) | (-3.90) | (-7.18) |
| liqui | -0.172*** | 0.0742*** | -0.159*** | 0.0545*** | -0.158*** | 0.0540*** |
| | (-10.93) | (8.70) | (-10.41) | (6.44) | (-10.27) | (6.35) |
| niir | 1.901* | -1.300** | 2.096** | -1.223** | 1.912* | -1.149** |
| | (1.93) | (-2.43) | (2.13) | (-2.25) | (1.93) | (-2.10) |
| growth | 0.708 | -1.123*** | 0.253 | -1.023*** | 0.748 | -1.263*** |
| | (1.19) | (-3.49) | (0.42) | (-3.08) | (1.25) | (-3.83) |
| _cons | -30.60*** | 89.31*** | -39.37*** | 98.81*** | -37.91*** | 98.22*** |
| | (-3.44) | (18.52) | (-4.49) | (20.33) | (-4.29) | (20.08) |
| N | 2645 | 2645 | 2645 | 2645 | 2645 | 2645 |
| adj. R2 | 0.717 | 0.830 | 0.719 | 0.823 | 0.715 | 0.822 |
| F | 24.73 | 67.75 | 27.69 | 54.12 | 22.99 | 50.21 |
| p | 1.13e-32 | 6.52e-89 | 1.01e-36 | 1.03e-71 | 2.75e-30 | 1.14e-66 |

Note: T-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1. roe: Return on Equity; t1r: Tier 1 Capital Ratio, calculated as Tier 1 Capital / Risk-Weighted Assets; depor: The ratio of personal and corporate deposits to total liabilities; dbankr: The proportion of funds a bank borrows from other banks relative to its total liabilities; dbondr: The proportion of funding that comes from issued bonds and reverse repos to total liabilities; ol: Leverage, calculated as Total Assets / Fixed Assets; lev: Leverage ratio, calculated as Total Assets / Total Liabilities; llr: Loan Loss Reserve / Total Loan; Liqui= Current assets / Current liabilities; niir: Non-Interest Income Ratio, calculated as Non-Interest Income / Total Income; growth: The average total asset growth rate.

*Source*: Authors' computations based on data from BankFocus

This result implies that the incremental deposit business of developing countries does not lead to an improvement in profitability and capital levels, but bank lending and bond issuance can effectively improve capital levels. The reason for this result is that the banking business in developing countries has stronger policy regulation, which makes them rely on deposits as their core business. Therefore, customer deposits will remain within a relatively stable range, thereby not affecting profitability and capital. At the same time, capital supplementation is more focused on lending and bond issuance. However, due to the relatively stagnant capital circulation, lending and bond issuance business would, in fact, affect the profitability of banks.

In Developed countries, it can be observed that the enhancement of deposit business can effectively improve the bank's profitability and capital accumulation. At the same time, the primary function of bond issuance and lending is to improve the bank's profitability, but at the same time, it has a negative impact on its capital. This is because the capital circulation in Developed countries is relatively smooth, which allows businesses that supplement capital to play their profit-making role in business operations. However, this profit-making improvement is affected by the country's monetary policy, which is relatively dependent on world currencies such as the dollar, leading to a certain degree of capital outflow.

**III. Robustness test**

The specific approach to robustness testing primarily involved using an alternative approach by varying the dependent variables. Instead of using net asset return rates and core capital adequacy as dependent variables, we substituted them with the return on assets (ROA) and total capital adequacy ratios. Robustness Result are presented in Table 8.

Table 8. Robustness test

| | (1) roa | (2) tcr | (3) roa | (4) tcr | (5) roa | (6) tcr |
|---|---|---|---|---|---|---|
| depor | 0.270*** | 3.353*** | | | | |
| | (5.04) | (9.46) | | | | |
| dbankr | | | -0.734*** | -0.457 | | |
| | | | (-8.98) | (-0.83) | | |
| dbondr | | | | | -0.479** | -3.199** |
| | | | | | (-2.53) | (-2.53) |
| ol | 0.417 | -61.66*** | 0.316 | -52.83*** | 0.952 | -53.75*** |
| | (0.36) | (-7.94) | (0.27) | (-6.76) | (0.81) | (-6.89) |
| lev | -0.00657 | -0.941*** | -0.00505 | -0.941*** | -0.00712 | -0.945*** |
| | (-1.49) | (-32.24) | (-1.15) | (-31.83) | (-1.61) | (-31.99) |
| llr | -0.121*** | 0.0368 | -0.125*** | 0.0110 | -0.124*** | 0.00737 |
| | (-22.01) | (1.01) | (-22.86) | (0.30) | (-22.47) | (0.20) |
| liqui | 0.00123* | 0.0248*** | 0.000692 | 0.0240*** | 0.00145** | 0.0260*** |
| | (1.75) | (5.33) | (0.99) | (5.07) | (2.03) | (5.46) |
| niir | 0.525*** | -3.180*** | 0.437*** | -3.685*** | 0.474*** | -3.738*** |
| | (7.86) | (-7.19) | (6.62) | (-8.26) | (7.11) | (-8.39) |
| growth | 0.249*** | 1.341*** | 0.248*** | 1.124*** | 0.236*** | 1.146*** |
| | (7.73) | (6.29) | (7.80) | (5.23) | (7.33) | (5.34) |
| _cons | 1.183*** | 100.5*** | 1.380*** | 103.2*** | 1.457*** | 103.6*** |
| | (2.90) | (37.17) | (3.42) | (37.91) | (3.57) | (38.03) |
| N | 4429 | 4429 | 4429 | 4429 | 4429 | 4429 |
| adj. R2 | 0.854 | 0.850 | 0.856 | 0.846 | 0.854 | 0.846 |
| F | 89.89 | 187.1 | 99.02 | 170.4 | 86.73 | 171.5 |
| p | 1.66e-121 | 1.50e-238 | 3.14e-133 | 1.41e-219 | 2.01e-117 | 8.22e-221 |

Note: T-statistics in parentheses, *** p<0.01, ** p<0.05, * p<0.1. roe: Return on Equity; t1r: Tier 1 Capital Ratio, calculated as Tier 1 Capital / Risk-Weighted Assets; depor: The ratio of personal and corporate deposits to total liabilities; dbankr: The proportion of funds a bank borrows from other banks relative to its total liabilities; dbondr: The proportion of funding that comes from issued bonds and reverse repos to total liabilities; ol: Leverage, calculated as Total Assets / Fixed Assets; lev: Total Assets / Total Liabilities; llr: Loan Loss Reserve / Total Loan; Liqui= Current assets / Current liabilities; niir: Non-Interest Income Ratio, calculated as Non-Interest Income / Total Income; growth: The average total asset growth rate.

*Source*: Authors' computations based on data from BankFocus

The results observed in Table 8 are consistent with the findings of the full-sample test and subsequent heterogeneity analysis conducted in this study. Therefore, the model used in this study demonstrates sufficient robustness.

## 4. Discussions

We examined the debt structure of Asia-Pacific banks and its effects on profitability and capital structure in this study. We found: Debt structure greatly impacts bank profitability and capital structure. Passive liabilities and bond issuance structure boost banks' core capital and profitability, while interbank lending reduces operating expenses and improves capital aggregation. Debt structure impacts bank performance due to country-specific banking operations. Deposit operations have little impact on profitability and capital levels in emerging nations due to regulatory rules and capital flow limits. Deposit operations boost banks' profitability and capital accumulation in developed countries due to capital market liquidity. To understand how debt structure affects bank profitability and capital adequacy, liquidity regulation is essential. Liquidity affects capital accumulation more in non-deposit businesses.

This study shows that banking regulatory policies and risk management techniques must account for debt structure complexity and variability. However, data availability and regional distinctiveness may limit our findings. Given the comprehensiveness of the sample size, the selected indicators may not fully cover the comprehensive profitability of commercial banks. Commercial banks face a diverse range of profitability indicators in their daily operations and management, and there are numerous indicators to measure profitability. However, this study attempts to select the most representative indicators.

The economic and financial environment is constantly changing, being frequent and complex. The optimization of the asset and liability structure of commercial banks and the improvement of their operational performance will always be issues of practical significance, necessitating ongoing research. Future research will be conducted in the following areas: Further refinement in the evaluation methods and selection of indicators for operational performance. This study's measurements of risk and corporate governance are not comprehensive enough, and future research will focus on constructing a more comprehensive system of evaluation indicators. It's still uncertain whether there is an optimal and reasonable range for the asset and liability structure, which needs to be addressed with a more rational and scientific empirical model. The mechanism by which the asset and liability structure affects different aspects of commercial bank operational performance is not clear enough. Future research could use multi-model classification studies to improve the accuracy of the research. Future research could also examine the role of regulatory frameworks and market conditions in shaping the impact of liability structure on bank performance.

## Conclusions and Further Research

This study examines the intricate relationship between the liability structure of commercial banks and their profitability and capital accumulation, focusing on the variances between developed (Australia, Japan, South Korea, Singapore) and developing countries (China, India). Utilizing a panel data model with individual fixed effects and considering bank size as a control variable, our findings reveal that passive liabilities positively correlate with commercial banks' profitability and aid in replenishing core capital. A significant insight is the regulatory role of liquidity, demonstrating that higher loans-to-deposits ratios reduce liquidity, negatively impacting profitability and capital accumulation. Moreover, our heterogeneity analysis differentiates the effects in developed versus developing countries, showing the effectiveness of bank deposit services in enhancing profitability and capital in the former, whereas in the latter, bond issuance and borrowing services boost profitability but at a cost to capital.

**Implications**: Our findings underscore the importance of a balanced and diversified liability structure for banks to sustain profitability and capital adequacy. Banks are encouraged to diversify deposit liability sources and avoid price competition by enhancing service and product quality. The development of non-deposit liabilities emerges as crucial for banks, especially for those facing challenges in attracting deposits. The study advocates for active liability management, emphasizing risk control and the maturity matching of interbank lending to mitigate liquidity risk.

**Limitations**: The study is constrained by its reliance on available data from selected countries, which may limit the generalizability of the findings across different regulatory and economic contexts. Additionally, the focus on passive liabilities and bond issuance may overlook other crucial aspects of banks' liability structures that could impact profitability and capital adequacy.

**Scope for Further Work**: Future research could expand by incorporating a broader range of countries to enhance the generalizability of the findings. Investigations into additional elements of banks' liability structures and their impacts on financial performance are also warranted. Furthermore, exploring the dynamic interplay between regulatory changes and banks' liability management strategies could provide deeper insights into optimal banking practices in varying economic climates.

By refining our understanding of how different aspects of liability structures impact bank performance across diverse economic contexts, this study contributes to the literature on banking efficiency and risk management. However, the evolving nature of global finance necessitates continuous research to adapt to changing market conditions and regulatory landscapes.


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## Credit Authorship Contribution Statement

**Jing Wang:** Conceptualization, Investigation, Data curation, Validation, Formal analysis, Writing – original draft.
**Aslam Izah Selamat:** Supervision, Writing – review and editing.
**Zariyawati binti Mohd Ashhari:** Supervision and conceptual framework.
**Mohamed Hisham Dato Hj Yahya:** Supervision and conceptual framework.

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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# Ecofeminism as a Movement: Choosing between Economics and Nature Protection

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**Abstract:** *This research aims to discuss the direction of the ecofeminist movement in Indonesia after the New Order. The world ecofeminist movement is often criticized because it is considered to obscure the essential spirit of feminism in its efforts to protect nature. However, in Indonesia, it is widely praised for its success in protecting wildlife from potential damage. This research uses ecofeminism theory and resource mobilization theory to examine the side of women's struggle to preserve nature. In order to identify research gaps and uncharted region for further investigation, this study employed a Systematic Literature Review (SLR). There are three stages involved in SLR: planning, conducting, and reporting. The results of this research are that there is strengthening within the organization of the ecofeminist movement when natural disasters and other potential natural damage occur, thus giving rise to collective awareness about the importance of women participating in protecting nature. This research concludes that the ecofeminist movement opens up new political opportunities for women to be empowered and prosperous and protect wildlife.*

**Keywords:** ecofeminisme; nature protection; social movement; walfare.

**JEL Classification:** Q56; Q57; O15; P16; J16; R11.

## Introduction

The ecofeminist movement has undergone a lot of criticism because it obscures the essential spirit of feminism (McKenna 1998; Buckingham 2004; G. Gaard 2010). However, is this true? This article attempts to provide a big picture of women and the nature protection movement, which, although full of debate, has been carried out in several different locations and has succeeded in reducing the high number of natural disasters that occur. The women in the ecofeminism movement in this article are not trapped in a patriarchal space that emphasizes the maternal vision when dealing with nature and associates women's concern for nature with the 'nature' of a mother who nurtures, cares for and cares for nature like caring for a family. Still, this ecofeminism movement emerged because of women's political awareness to maintain and protect nature for the welfare and sustainability of nature (Swain and Swain 2004).

With the ultimate goal of constructing new gender relations between humans and nature as well as between women and men, ecofeminism can be defined as a link between feminism and the radical ecological movement (Giele and Threlfall 1997). When ecofeminism is combined with a social movement, it can effect social change (Nash 1992; Warren 2002) and empower women to defend their own identities, families, and lives. However, one thing is for sure: ecofeminism can provide women both material and non-material political chances. Increasing income, welfare, and employment opportunities is the ecofeminist movement's ultimate material goal in order to secure future generations (McMahon 1997; Barry 1998; Hajad 2020). Women's strong desire to preserve the environment and leave a protected environment for their children and grandkids can lead to non-material political prospects.

The ecofeminism movement is a women's movement needed to save the earth (Clarke 2001). The fundamental work of this movement, according to Clarke (2003) inspired by Aldo Leopold's essay 'Land Ethics' (1949) about the environment and gave birth to the modern nature conservation movement and illustrates how this issue can be seen through the framework of women's concern for nature. Ecofeminism emphasises the call to end oppression and free nature from exploitation. Ecofeminism is a theory that emerged in 1974 and made women the main actors in protecting nature and protesting against environmental destruction. In fact, a lot of perspectives perceive women and environment as closely related due to their reproductive roles, biological status, and experiences with prejudice (Salleh and O'Connor 1991; Oksala 2018). Consequently, the goal of ecofeminism, both conceptually and practically, is to do away with the patriarchal method of problem-solving and potential environmental deterioration (Salleh 1996).

This movement experienced pros and cons in its emergence. Pro groups see eco-feminism as a breakthrough because it can accommodate all groups, especially women, in protecting nature. It has been proven that the eco-feminism movement has been successful in many places, such as the Love Canal Movement in the United States, the Chipko Movement in India, the Green Belt Movement in Kenya, and Women and Trees Bangladesh. These four movements prove that the women's movement to protect the environment is present and trying to change the situation. Meanwhile, opposing groups see that the idea of the ecofeminist movement is contradictory to the position of men who dominate nature, thus creating an ecological crisis in most parts of the world (G. Gaard 2010).

These two significant arguments about the ecofeminist movement make the study of ecofeminism with a social movement framework even more attractive (Eschle 2018). Ecofeminism, a women's movement to overcome ecological problems, can be an effort to find non-violent solutions through political work (Iversen, T., Rosenbluth, F. M., and Rosenbluth 2010). Several previous studies emphasize ecofeminism on women's collective concern, which originates from internal awareness about the importance of maintaining a balance between humans and nature. Many academics say ecofeminism is a social movement (Steuter 1992). However, Howell (1988) sees that it is too early to see ecofeminism as a movement and sees ecofeminism as still limited to philosophy of thought. However, this article sees that ecofeminism still has the opportunity to be seen as a women's movement to fight for economic and natural conditions.

Even though it is considered a new view, ecofeminism has been around for a long time in Indonesian society because it is a discourse related to the relationship between women and nature which seeks to create and preserve nature and the environment based on femininity or women (Singh 2023). Examples of the practice of ecofeminist discourse in Indonesian society can be seen from the women's movement that occurred in Central Java called 'Kartini Kendeng' in the form of conflict and the 'Female Ranger Damaran Baru' in the form of a protected forest protection movement. This research examines the women's movement through the lens of ecofeminism in fighting deforestation and wildlife poaching in Central Java Province and Aceh Province.

## 1. Literature Review

The critical ecofeminism movement was created by Plumwood and expanded by Gaard (2017), which was formed because of the connection between the feminist and environmental movements. The critical ecofeminism movement aims to theorize and realize the formation of relationships between humans and non-humans based on care while simultaneously trying to question every potential cause of marginalization and injustice (Li and Li 2023). Furthermore, Gaard (2017) developed the definition and goals of the ecofeminist movement to be broader, which is not only related to the conceptual basis in the form of symptoms and structures of oppression but also related to how domination is regulated so that there is no domination of humans over nature, domination of men over women, and culture over nature so that structures of oppression can be overcome (Gaard, 2011).

Ecofeminism provides a theoretical path to understanding the phenomenon of oppression by emphasizing a materialist approach. Agrawal (2001) said that the source of domination in pressure practice is economic gain and political power (Agarwal, 2001). This materialistic structure of oppression is widely understood to be the basis of the ecofeminist movement. Here, we see a research gap that the author wants to convey to readers: An ecofeminist movement is not based on material things but on women's concern for environmental conditions. Women and nature have a dynamic intra- and inter-species relationship that exceeds the criticism of previous research, which sees women as green motherhood who are accepted for caring about nature.

Therefore, this research considers it essential for the ecofeminist movement to be seen through an actor approach. In this approach, the ecofeminist movement emerged because of differences in costs and benefits obtained by actors, especially costs and benefits directly related to environmental change (Wong *et al.* 2023). Thus, some parties benefit and suffer losses in utilizing the environment and nature, although the basis is not always material. Often, this unequal distribution of costs and benefits ultimately leads to the creation of socio-economic inequality, which also has political implications in the form of changes in power in the relationship between one actor and another (Bachev 2023).

The actor approach assumes that there are always actors who have power over nature, resulting in unequal and fair economic and social distribution, giving rise to many new marginal groups. Political ecologists have long observed that there is always an impact of environmental change on humans due to the unequal distribution of benefits, leaving marginalized groups of women at an even more significant disadvantage. Research by Jonathan (2021), Nyandiko (2020), Bernard (1985), Hess (2022), 2018), and Shower (1989) with an African community background states that the causes of environmental damage, such as erosion and soil damage, always place local farmers as actors who cause natural damage must therefore be responsible for land damage. The colonial government used this claim to justify taxes or fines as "land conservation" for farmers.

Similar conditions also occur today, even though the colonialists no longer colonized Indonesia. However, Indonesia's nature is still controlled by companies that control the land, and local community groups are powerless because of their limited knowledge. Knowledge about humans and the environment has been produced, intervened in, and bound by government power relations and then lent to companies. So it is not surprising that women as a group of subordinate and marginalized communities always lose in the battle for knowledge reproduction and environmental intervention when dealing with developed countries, and at one point strengthen economic and social injustice towards subordinate communities (Bryan, 2016). The reproduction of knowledge in transformative ecofeminism studied by Shiva (2014) illustrates how to minimize unequal power relations by recognizing and explicitly recognizing the interconnections between all environmental systems and emphasizing the diversity of women's experiences to reject domination (Garcia *et al.* 2022).

Similar conditions also occur today, even though colonialists no longer colonize Indonesia. Still, Indonesia's nature is controlled by companies that have control over the land, and local community groups are helpless because of their limited knowledge. Learning has been produced, intervened in, and bound by government power relations and then lent to companies. So, it is not surprising that women, as a subordinate and marginalized group of people, always lose in the battle of knowledge reproduction and environmental intervention when dealing with developed countries, and at one point, strengthen economic and social injustice against subordinate people (Bryan 2016).

Transformative ecofeminism offers a holistic, pluralistic and inclusive perspective, enabling men and women to build equal relationships, prevent violence, oppose war and protect the natural environment in which they live. Ecofeminism, like multicultural and global feminism, is a flow of feminism that sees various forms of oppression against humans and intimidation carried out by humans against non-humans, such as nature. Because women are always associated with nature, environmental discussions become important in feminist discourse. However, at this level, ecofeminists do not want to return women to natural arguments but instead see it as a feminist consciousness, namely seeing the existence of oppressive relations in environmental discourse (Purdy and Warren 1999).

Shiva in Gaard (1996) explains that people from third-world countries (in this case, women) are actively involved in movements to save the environment and do not receive many positive things. On the contrary, currently, local communities, poor groups, and women who are victims of environmental damage must bear a more significant burden of suffering and are the groups who are blamed (blamed the victims). This study found that several ecofeminist movements carried out by women's groups in Indonesia still have yet to receive positive appreciation from the state and society, no matter how great women's struggle to protect nature. However, even without appreciation, great women such as women in Central Java and Aceh as nature protection actors still carry out their duties in protecting the environment in their places.

## 2. Research Methodology

In order to identify research gaps and uncharted region for further investigation, this study employed a Systematic Literature Review (SLR) and extra information gleaned during interviews. According to Kitchenham (2009), there are three stages involved in SLR: planning, conducting, and reporting. First step is planning. Before beginning the actual research process, the researcher plans by identifying the necessary steps for performing a literature study and fixing them. In other words, the researcher first ascertains the basic substance of a scientific article before reading it, and then goes on to formulate the research question that serves as the foundation for a literature review. Second step is conducting. Looking for literature materials is the conducting stage's task.

comprises the following steps: locating research, picking primary research, gaining access to high-quality literature, extracting data, monitoring it continuously, and synthesizing it. The "searching" media used in this study came from a number of indexers, including Wiley, Science Direct and Scopus.

Third step is reporting. The next step in the reporting process is creating well-organized literary materials. After being sorted through hundreds of articles, they are reduced to tens, then dozens, which are prepared for reading and analysis. Currently, the researcher searches databases using online indexers to gather hundreds of data points. The papers should then be sorted by abstract, title, and keyword review until only dozens of them remain for a thorough study.

## 3. Result and Discussion

### 3.1 Research Results

#### Ecofeminist Movement in Indonesia

Ecofeminism as a movement and idea is still relatively new in Indonesia, so few examples show a women's movement in saving nature. As a result, the women's movement in Indonesia often needs a stronger foundation in society, so it quickly experiences fragmentation into two groups in the field. The first group is subject to state co-optation through efforts to weaken women's ability to represent the entire scope of women's interests (Blackburn 2004). The second group, in the form of environmental and agrarian movement groups, are not united in the struggle, so cross-group partnerships in building environmental movements have not been consistently carried out, even though environmental issues are increasingly being advocated (Peluso, Afiff, and Rachman 2008). These two examples show that the ecological movement carried out by women is not yet excellent in the agenda contestation at the national level and could threaten the nature conservation agenda in the future (Coric 2014; Liu, Anser, and Zaman 2021).

#### Central Java Ecofeminism

One example of the women's movement in fighting for the sustainability of nature and the environment is women in Kendeng, Central Java. The Kendeng area is famous for its natural wealth of limestone, the primary raw material for cement products, stretching across the North Kendeng Mountains. However, this natural wealth later became a source of conflict when cement companies wanted to explore the area. The women in this area reject the exploitation plans carried out by PT. Semen Gresik established pasta factories in 2005 in four sub-districts, including Sukolilo, Kayen, Gabus, and Margorejo, divided into fourteen villages with a total land area of 1,350 hectares (Hadi *et al.* 2020).

The emergence of a cement factory in the Kendeng mountains cannot be separated from the Central Java Provincial government's interest in getting trillions of rupiah in investment into Central Java. This investment will stimulate the economy because it can absorb thousands of workers and encourage regional economic growth (Asrawijaya and Hudayana 2021). Several female farmers in Kendeng who are nicknamed "Kartini Kendeng" consistently voice their rejection of the existence of PT. Semen Indonesia because its mining activities are considered to hurt the surrounding environment (Sturgeon 1999; Weiss and Moskop 2020). The impact can be massive, ranging from agricultural land and air pollution to water sources. Kartini Kendeng has voiced this rejection since 2014 when PT. Semen Indonesia still plans to build a factory in Rembang. Figure 1. Kartini Kendeng Central Java can be seen below.

Figure 1. Women 'Kartini' Kendeng Central Java


*Source*: (BBC News Indonesia 2017)

The ecofeminist movement 'Kartini' Kendeng in Central Java is a result of their conviction that the construction of a cement factory will disturb the groundwater basin, so interfering with their farming activities (Hari 2023). In addition, the operation of a cement mill will reduce the amount of area available for habitation by the locals and result in major social issues down the road. The Central Java Provincial administration wants to promote regional economic growth by building a cement factory, hence this goes against their goals. In response, Kartini women in this movement fought back by adopting the same philosophies as their colleagues, and they were aided by the media and civil society organizations (Susilo and Kodir 2019). They even used cement to cast their feet for a number of theatrical performances in front of Jakarta's Merdeka Palace. It will connect their lives together as a semiotic emblem of resistance against the cement mill. Women take tremendous measures to safeguard themselves and their family, and they place a high value on nature, particularly the groundwater basin area. The Kendeng women's group practices environmental protection based on beliefs and practices in an attempt to live (Cochrane 2007).

The emergence of factories that have the potential to destroy nature has given rise to an ecofeminist movement from women (Mellor 1992; McKenna 1998; Greta Gaard 1996; Salleh 2003; Lahar 1991), which shows three essential things, namely: (1) the issue of women and the environment can be a justification for the women's movement against large corporations, (2) urgent situations often give birth to women as leaders. Who can disrupt, raise awareness and mobilize other women to unite, and (3) show women's unique resistance to the cement industry and attract public attention. The emergence of the Kendeng women's movement, based on ecofeminist thinking, cannot be separated from women's anxiety about ecologically destructive practices which lead to gender injustice and can deconstruct the ecological degradation carried out and dominated by men towards nature through actions that are classified as extreme, such as immersing their feet. Cement symbolizes women's resistance to the construction of a cement factory.

## Aceh Ecofeminism

One of the ecofeminist movements in Aceh is the Women's Ranger Movement in Damaran Baru, Bener Meriah Regency. This female ranger is tasked with guarding forest areas at an altitude of 1.000-2.500 meters above sea level and managing 251 hectares of protected forest area after obtaining a management permit from the Ministry of Environment and Forestry (KLHK). The female ranger is also tasked with guarding the Wih Gile River watershed, the source of springs for several villages. The Women's Ranger Movement led by SM was driven by flash floods that often hit the villages yearly. One of the major disasters occurred in 2015, namely a flood and landslide that washed away 11 houses, gardens and residents' land. Apart from protecting the forest, the Female Ranger also conducts nursery and planting activities for several types of trees that can withstand landslides and inventory fauna and flora in protected forest areas. Figure 2. Female Ranger Damaran Baru Aceh can be seen below.

Figure 2. Female Ranger Damaran Baru Aceh

*Source*: (BBC News Indonesia 2020)

This women's movement, called the Female Ranger, started in 2017. in Damaran Baru, there has been a large-scale movement of people who care about the environment, and they voluntarily formed a group of forest guards totalling 40 people called rangers, 23 of whom are middle-aged women with alternating climbing schedule. They climbed mountains, spent the night in the forest, and determined forest areas that needed to be protected by patrolling for five nights before finally descending the hill and being replaced by another team of forest guards. It is not uncommon for them to encounter lying loggers who steal forest trees or lying hunters who capture animals that live in the protected forest areas they cover, such as gibbons, clouded leopards and sun bears. The stability of the coffee business in Bener Meriah and Central Aceh Regencies due to the increase in the price of Gayo coffee also has an impact on the forest monitoring process because they have to deal with relatives or relatives who want to open coffee plantations in protected forest areas even though there are forest protection regulations (Najmuddin *et al.* 2022).

The ecofeminist movement in Aceh does not aim to fight corporations but to fight people's habit of destroying forests. Therefore, the Female Rangers try to protect, preserve and monitor the natural sustainability of the village by deploying a group of forest guards called rangers to prevent forest encroachment and wood theft and directing the forest for plantation areas is one of the activities carried out. Apart from that, they also carry out reforestation by planting new trees in forest areas. This original initiative of the Damaran Baru community received full support from the Non-Governmental Organization (NGO) Burni Telong, the Forest, Nature and Environment NGO (HAKA) Aceh, and the Ministry of the Environment. In interview with the village head of Damaran Baru, IR:

"The formation of female rangers in the Central Aceh region was due to mothers' awareness of the importance of protecting nature. Female rangers have been around since 2015, the aim is to prevent forest encroachment on the mountains," (IR, Interviewed 20th August 2023).

The impact of the 2015 flash flood made women aware of creating a Damaran Baru forest protection task force immediately. Before their arrival, forest encroachment in the forest area, which the Gile River crosses, was very high and dangerous for their location. The movement they carried out at first was patrolling without any special knowledge about preventing forest encroachment. However, these female Rangers have been accompanied and coached by the Aceh Forest, Nature and Environment Foundation (HAkA) until they are adept at exploring and recording flora and fauna and monitoring and preventing forest encroachment.

The head of the Female Rangers, SM, said that patrolling was a form of their responsibility to protect biodiversity sources by reforesting damaged forests along river flows. Female rangers, as part of the ecofeminist movement, aim to protect forests, springs and other sources of life directly and sustainably. In an interview with SM: "Up until now, it has appeared like the job of men to safeguard trees. However, it is what we, the Damaran Baru Aceh Female Rangers, do. Despite the fact that in order to access deeper areas of the forest, we still use male patrol squads." (SM, August 15th, 2023 Interview). They must traverse steep, harsh, and rocky terrain as part of their forest protection duties, which include forest patrols in the Gunung Leuser National Park Ecosystem Area. They acknowledge, nevertheless, that they are earnest in their desire to spare their community from tragedy so that their children and grandkids won't have to go through similar experiences as they had, such landslides and flash floods.

### 3.2 Discussions

### Resource Mobilization and the Opening of Political Opportunities

The resource mobilisation carried out in the ecofeminist movement can be seen through the resource mobilisation theory. A movement needs resources to gain political opportunities; even McCarthy-Zald (1977) actors in the movement greatly determine the potential and patterns of mobilisation shown in the form of strategies (Goldstone 1980) played by the women's movement in protecting nature even though sometimes it has to conflict with the government, as happened in Kendeng, Central Java (Giugni 2009)so that to be successful, political alliances with civil society and the mass media are needed (Gamson and Wolfsfeld 1993). If the resources of the ecofeminist movement are mobilised, they will be very effective in developing political opportunities for its members. Resources in the ecofeminist movement can be material and non-material resources. Material resources include money, labour, technology, means of communication, mass media, and organisations. Meanwhile, non-material resources in the ecofeminist movement include legitimacy, loyalty, social relationships, networks, personal connections, public attention, authority, moral commitment, and solidarity (Fuchs, 2006).

The resource mobilisation carried out by Kartini Kendeng Central Java and Female Ranger Damaran Baru Aceh stems from their character of being close to and dependent on nature. It has implications for the results of social movements that can be seen in many mass media. They implement at least five main principles during resource mobilisation actions (Jenkins 1983): (1) The actions of members of the ecofeminist movement are rational. (2) Movements arise because there is an imbalance of power against the state, corporations or fellow civil society, which sometimes takes the form of a conflict of interest. (3) Power imbalances ultimately lead to resource and organisational mobilisation. (4) A formally structured ecofeminist movement such as the Aceh Women's Ranger is more effective in mobilising resources and achieving change goals than the informal movement carried out by Kartini Kendeng, Central Java. (5) However, the success or failure of the ecofeminist movement is greatly influenced by the movement's strategy and the surrounding political climate (Foster 2021).

Resource mobilization within the ecofeminist movement is essential in ideas about women because it can open up many political opportunities. Giele and Threlfall (1997) proposed the need for politicization in the ecofeminist movement so that women's moral interests do not experience privatization, localization and narrowness so that it can positively impact politics. Apart from that, the involvement of women in the ecofeminist movement, as stated by Estévez-Saá (2018) can connect the domestic space with the public space through feminist politics. The women's ecofeminist movement in various regions in Indonesia, apart from containing the ideas of female caring and motherhood, which are very typical of feminist theory, also needs to be connected to the theory of justice so that the changes desired by ecofeminism can occur through political actions at the grassroots level. Lahar (1991) strengthens this argument by emphasizing the connectedness and responsibility aspects of women as movement actors to create an informative and generative ecofeminist movement.

Ecofeminism also contributes a framework regarding the interplay between social and environmental problems through the political empowerment of women carried out by various communities. Ecofeminism has so far been interpreted narrowly as a subordination of women in the form of resistance to oppression, domination, hegemony, injustice and violence against women. It can be interpreted more broadly as a relationship between men and women that is characterized by injustice and oppression, with the victims mostly being women. Thus, feminism seeks to identify the causes of injustice, try to overcome them and focus on the subordination of the natural environment (ecosystem) to human interests. Ecofeminism that occurs in Indonesia aims to look at social, cultural and structural problems in the form of extreme domination in relations between groups and the relationship between humans and their natural environment, which results in much suffering for humans.

## Conclusions and Further Research

This research concludes that the ecofeminist movement opens up new political opportunities for women to be empowered and prosperous and protect nature. Through the ecofeminist movement in Indonesia, women can consolidate and mobilize the resources of other women, thereby raising collective awareness about the importance of women participating in protecting nature. In the end, the ecofeminist movement opened up wider political opportunities for women to be empowered and prosperous and protect wildlife. If an ecofeminist movement is able to successfully mobilize resources, it can attain political success in accomplishing its material and non-material aims, as well as achieving justice for both humans and environment such as the ecofeminist movements occurring in Aceh and Central Java.

## Credit Authorship Contribution Statement

**Vellayati Hajad**: Conceptualization, Investigation, Methodology, Writing – original draft, Data curation, Validation, Writing – review and editing.

**Ikhsan Ikhsan**: Conceptualization, Methodology, Project administration, Writing – review and editing

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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# Budget Deficit, Debt, and Inflation in Ghana (1960-2022): The Fiscal Theory of Inflation Case?

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**Abstract:** *This study follows the approach in Kehoe and Nicolini (2021) in order to analyse and interpret the historical performance of Ghana's economy over the period 1960-2022 in terms of deficits, public debt accumulation, monetary policies and their relationships to inflation, exchange rate etc. The paper explores the link and similarities between Ghana's economic cycle from pre- and post-military rule. In both cases, excessive borrowing, leading to a large accumulation of public debt, and accompanied with burdensome debt interest payments, has been one of the major challenges that the country must wean itself from.*

*The study also documents that the underlying reason for the deficits is the low domestic revenue mobilisation, i.e the fiscal capacity of Ghana is lower compared to the one of developed countries. Finally, the positive interaction between money supply and inflation has also been established in this study. However, the increase in money supply (and thus inflation) is a result of fiscal imbalances: by printing money, the Central Bank of Ghana is effectively using inflation as a tax and trying to generate a seigniorage revenue to "cover" at least part of the budget deficit.*

**Keywords:** inflation; seigniorage; budget deficit; debt; fiscal theory of inflation.

**JEL Classification:** E62; R11.

## Introduction

Has Ghana lived up to her name as the "black star" of Africa after six decades of independence? The purpose of this study is to outline and find the major macroeconomic setbacks that has rocked the Ghanaian economy between the periods of 1960-2022. Often described as the gateway of Africa due to its position and shape on the continent, Ghana is a country located in West Africa with a population of over 30 million and a GDP of about $77.59 billion as at 2021 (World Bank, 2021). After gaining independence from the British in 1957, the country has gone through the pain of dealing with four successful coups leading to economic upheavals that has derailed economic growth and development. The story has however changed since 1992 when the country finally returned to a democratic rule. The country began to experience stability post 2000. As compared to its peers in the sub-Saharan Africa, Ghana is now seen as a beacon of democracy where human rights and freedom of the press is valued despite its numerous economic challenges.

Throughout history, Ghanaian leaders have had an insatiable appetite for excessive borrowing to the point of not being able to pay back. As a result of this excessive borrowing, Ghana has been to the IMF 17 times for economic bailout with the year 2023 being the current as negotiations are still in progress. The country's first engagement with the IMF was in 1967 after it experience its first ever Coupe Detat that left the economy in shambles. Ever since then, it has become the fifth highest country in the sub-Saharan Africa to seek assistance from the Fund. This comes after Liberia with 21 programmes, Kenya with 19 and Sierra Leone and Mali with 17 programmes respectively (Mynewsgh, 2022).

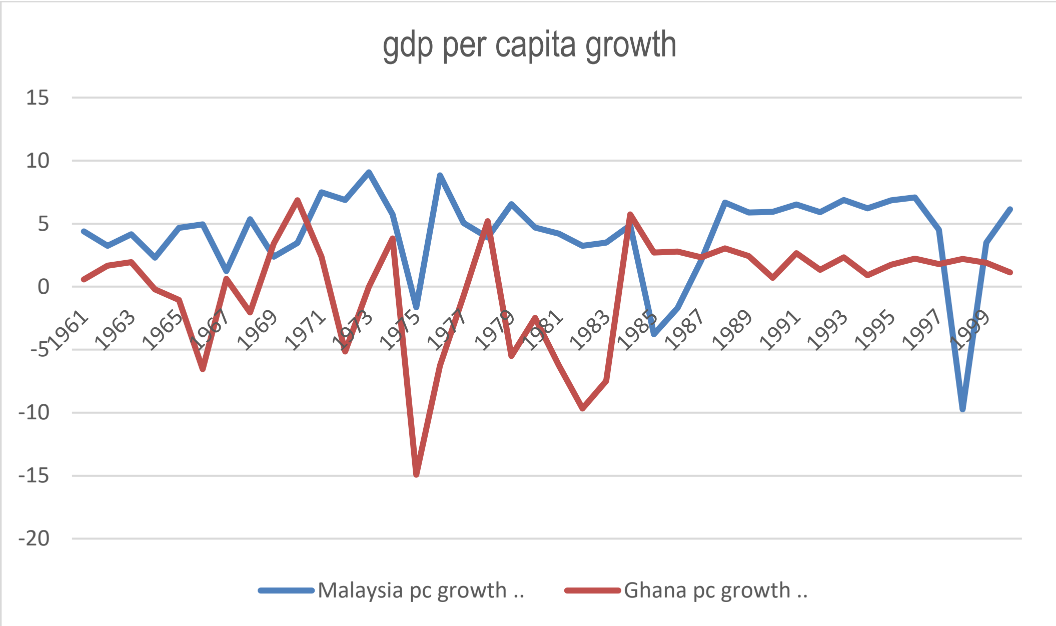
With regards to electricity, the country at a point had to grapple with power crisis which began in the early 2000s. Ghana has always relied on one dam (Akosombo) for electricity since independence. Due to increase in population and without corresponding expansion of electricity supply, the country had to face over 2 years of power crisis in 2010. It was partially resolved and later got worse in 2012 where the country had to rationed power supply for 4 years. This affected the growth of the economy within this period and led to high unemployment. Private businesses were one of the biggest hits within this period.

### 1. Historical Comparison with Malaysia

To put things into better perspective and understand the country's growth, let's consider a country like Malaysia that gained independence with Ghana within the same period. Malaysia currently has the same population with Ghana and has a GDP of over $400 billion which is over five times that of Ghana's GDP. In terms of other development indicators such as infrastructure, education, health etc, Malaysia is far advanced than Ghana. According to Prof. Bokpin, a Ghanaian economist, one is 78 times better off living in Malaysia than in Ghana considering the current economic indicators (twitter, 2023).

From Figure 1, it can be acknowledged that Ghana has experience sporadic and inconsistent negative growth since independence. It was able to maintain stability in the late 90s. However, Malaysia has had positive and consistent economic growth post-independence. Therefore, the impact of political stability cannot be underestimated in achieving economic prosperity. As Ghana was grappling with over three decades of instability, its counterpart was setting up institutions to achieve economic growth. It is not surprising that Malaysia is more developed and has a stronger and better economy than Ghana.

Figure 1. Per-Capita GDP comparison between Ghana and Malaysia post-independence



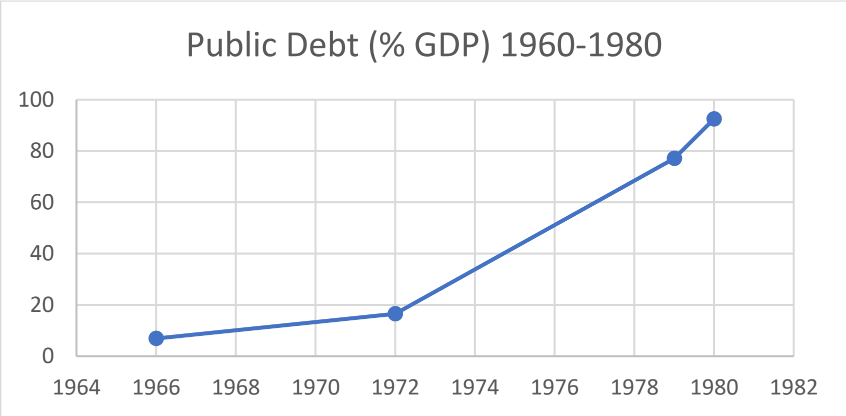

*Source*: World Bank (2024)

### 2. Evolution of Public Debt and IMF Bailout

Prior to the country's first ever coup after independence, Ghana's public debt stood at 6.9% of GDP in 1966 (see Figure 2). The then government was accused of reckless spending by wanting to help other countries gain independence and investing hugely into these country's which will not benefit Ghana in any way. Since then, the country's debt to GDP has continued to balloon.

It is important to note that during this period, the country went through various economic and political changes. In 1966, a military coup occurred, which led to a change in the government's policies. In 1970, Ghana went through a period of economic decline as inflation and falling commodity prices led to a decline in the country's GDP. As mentioned in the previous paragraph, the country was basically stagnant during this period (1960-1990) with a growth rate hovering in the negatives. In 1979, a second coup occurred, which resulted in a significant increase in the country's debt-to-GDP Ratio at unsustainable rate of over 90%. By 1983, the country had finally collapsed. Inflation was rampant and over 100%, there was widespread famine, and the country displayed all the attributes of a collapsed economy. This continues to be one of the dark periods in Ghanaian history. In other to help the country recover from this shock, the IMF provided a total of $200 million in loans from 1983-1986.

Figure 2. Growth of public debt after first military takeover.




*Source*: World Bank data (2024)

Speaking of economic nightmare, as documented in Table 2 below, year 2022 has shown similar characteristics of what Ghana went through in 1983.

Table 2. Worst economic performance in Ghana's history

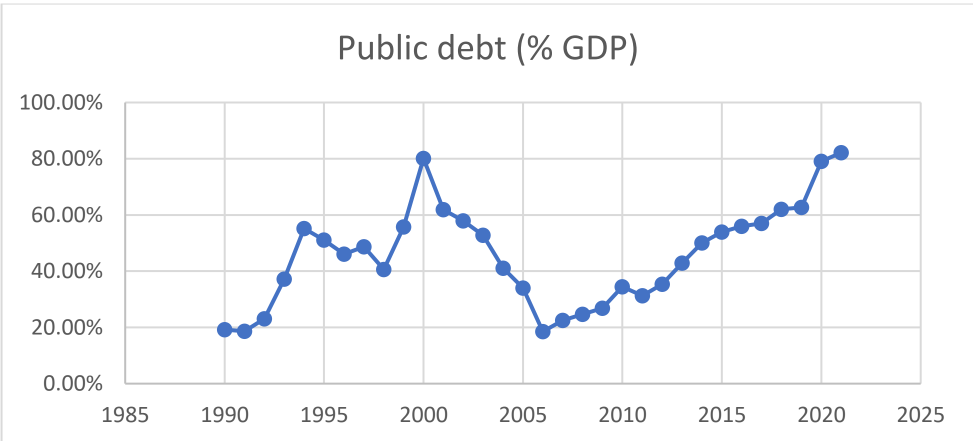
| Year | Debt-GDP | Inflation | Credit rating |
|---|---|---|---|
| 1983 | 93% | 122% | Junk |
| 2022 | 105% | 55%/ 102% (unofficial) | S/D (- outlook) |

The country is currently facing debt crisis leading to a debt restructuring which is first of its kind in history. This has become necessary and a condition for an IMF program.

During the 1990s, Ghana implemented various economic reforms with the help of international organizations to tackle the debt problem in other to have fiscal space. These reforms helped reduced its debt-to GDP ratio from over 90% in the previous years to about 20%. However, the country still faced various challenges in terms of economic development, child malnutrition and widespread poverty. By the year 2000, the country's debt had quadruple to over 80% of its GDP. Thus, derailing the achievements chocked in the 90s. Fortunately for the country, the IMF introduced an enhanced debt relief scheme under the Highly Indebted Poor Countries (HIPC) initiative. Ghana joined the program in 2001 that led to half of its debt being cancelled.

The country had already received a combined amount of over $550 million between 1991-1995. Prior to joining HIPC in 2001, the country received an additional $290 million. Instead of paying back the old loans, IMF directed Ghana to invest the loaned monies into education, healthcare, good governance, and other developmental projects. This brought huge relieve to the country as it got the fiscal space to invest and embark on developmental projects. After this period, Ghana has enjoyed and experienced a high economic growth up until now where it is expected that the public debt to be over 100% of GDP per expected 2022 figures. Figure 3 below shows the trend of Ghana's public debt from 1990-2021.

Figure 3. Public debt evolution (1990-2022)



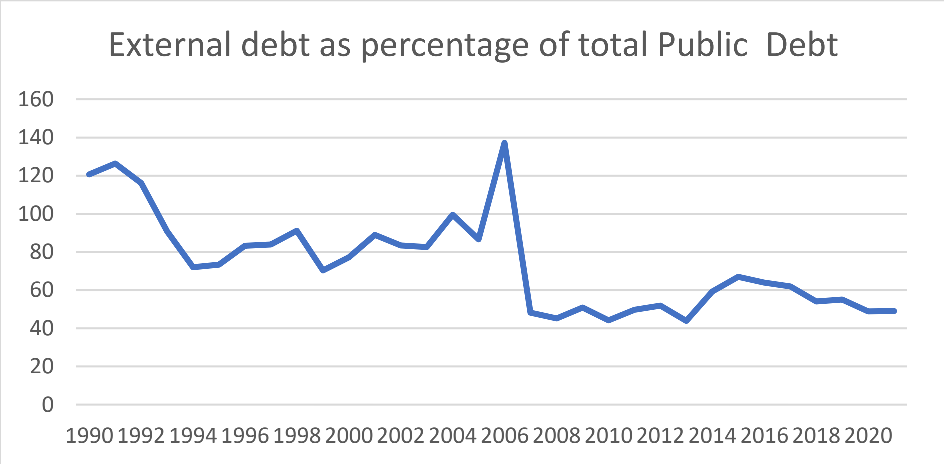

*Source*: World Bank data (2024)

This cyclical graph is typical of most developing countries and their appetite for excessive expenditure. After recovering from the 1983 crises where debt to GDP was over 90%, the country returned to normal levels of debt in the 90s after several domestic and international interventions. It got worst in the 2000s before it subsequently reduced to sustainable levels.

### 3. External Debt Growth

The debt evolution is shown in Figure 4. In addition, the correlation between Total public debt and External debt structure is 0.99, as Ghana borrows exclusively in foreign currency. External debt has been a major source of financing the government's budget deficit for a very long time. The peak was in 1990 and 2005 where external debt consisted of 120% and 140% of total public debt respectively.

Figure 4. Foreign debt accumulation (1990-2020)




*Source*: World Bank data (2024)

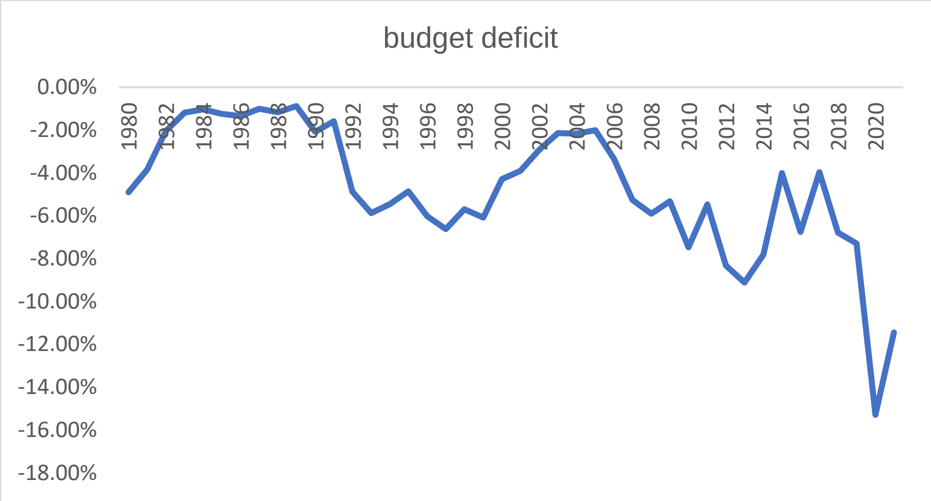
The sharp decline in 1990 and 2005 were because of debt relief after reaching unsustainable levels of over 60%. The graph shows a cycle that repeats itself after 15years. It is therefore safe to say that the optimum external debt stock should not be more than 60% of total public debt. This is because, the lack of credibility of the country to repay its loans leads to higher interest rates. Since most external debt are financed in foreign currencies, it puts pressure on the local currency leading to depreciation and inflation (imported inflation) which has been a major problem for the country.

### 4. Budget Deficit

Consistent running of budget deficit has grave consequences for any economy like Ghana. Firstly, budget deficit can lead to crowding out the private sector. Since government is a safe borrower, everyone prefers to lend to government. Therefore, a large amount of government borrowing could result in higher interest rates which would deter private investment and limit economic growth. Budget deficit can also lead to debt crisis which has been proven throughout history. The Ghanaian government has consistently had to take out more debt to finance its spending.

This has led to a rise in public debt which has led to high cost of borrowing and decreased investor confidence. Budget deficit has also led to severe inflation where the government resorts to printing money to finance excess spending leading to a loss of value in the local currency. Excessive budget deficit put the government in a tight corner and affects its ability to respond to shocks in periods of crisis. As shown in the graph, in 2019 during covid, the government run a budget deficit of negative 15% despite receiving over a billion dollars from the world bank and IMF. In order to have a positive impact on growth, monies borrowed must be invested in capital and infrastructural projects that can pay off these debts in the future.

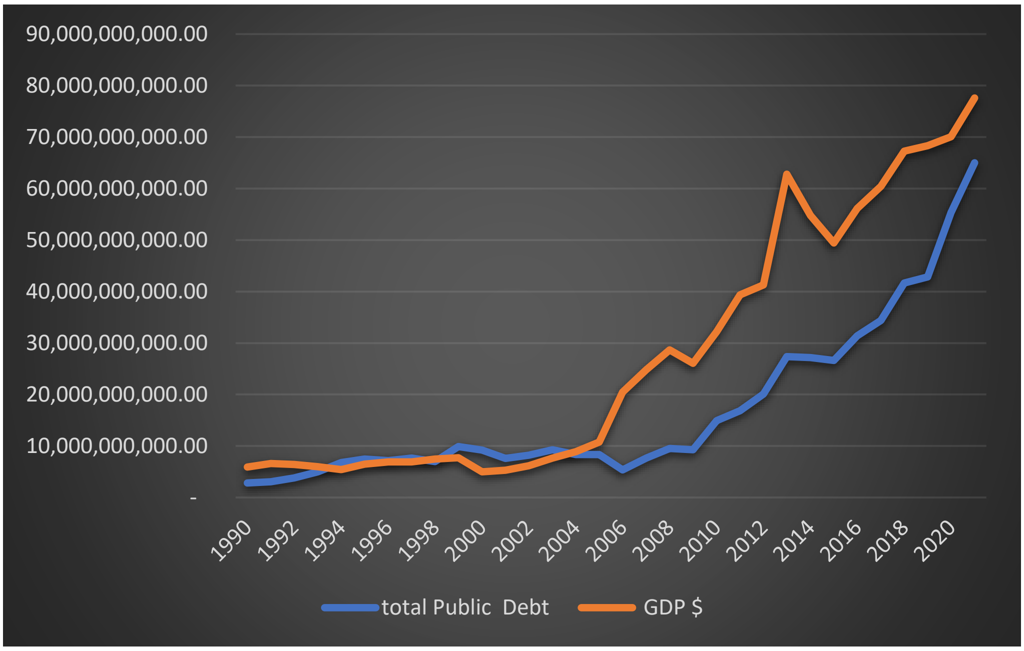
Figure 5. Budget balance/GDP in Ghana (1980-2020)




*Source*: World Bank data (2024)

However, most of these monies are used to finance consumption part of the budget which adds zero growth to the economy. There has been situation where monies have been borrowed to pay for salaries. Compensation and interest payment part of the budget will be dealt in the subsequent paragraphs. Figure 6 shows the growth of the country relative to its total debt stock. It is important to note that the Ghanaian economy stabilized after 1990 and began to expand and experience real growth after 2001 when it signed up to the IMF HIPC program.

Figure 6. GDP and total debt in US dollars




*Source*: World Bank data (2024)

From Figure. 6, we could see that actual GDP began to grow parallel with the debt stock. The massive jump in 2011 was attributed to the discovery and production of crude oil in the mining sector which grew at 225.4% (Ghana statistical service , 2011). The graph also proves my previous assertion that debt to GDP is nearing 100% as the two lines begin to meet.

Table 3. Public debt growth (10 year intervals)

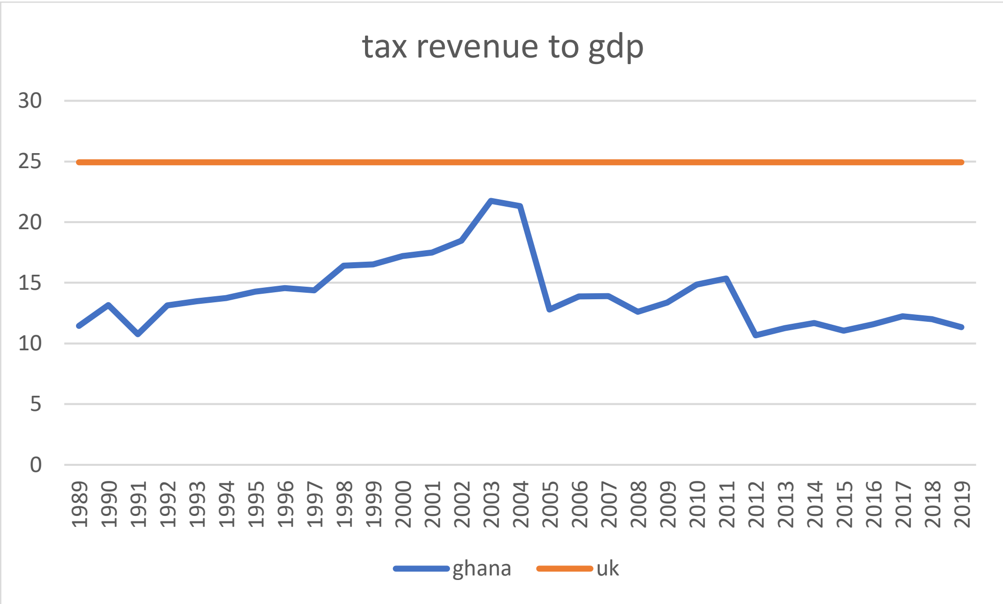
| | 1960-1980 | 1981-1991 | 1991-2000 | 2001-211 | 2012-2022 |
|---|---|---|---|---|---|
| Change in debt | 1433% | | 225% | 122% | 223% |

*Source*: World Bank (2024) and Ghanian Ministry of Finance (2024)

## 5. Tax Revenue

Due to the informal nature of many developing countries, one of the major challenges they face is internal revenue mobilisation. Comparing the United Kingdom that has perfected its tax collection system has consistently maintain an average of 25% tax revenue to GDP for over four decades. Meanwhile, the tax-to-GDP for Ghana as of 2021 was 13% which was well below the over ambitious target of 20% by 2023. This has largely led to the country's overdependence on borrowing and foreign aid. Looking at the UK system, it is observed that tax revenue has been consistent with modern days growth. This is because as at 1972, the UK had a tax revenue to GDP of 22.7% whereas Ghana had 11%. Maybe 13% is the optimum tax-GDP for Ghana unless there are structural changes to the economy. Because further taxation leads to a fall in tax revenue. According to the OECD, the average tax-to-gdp of the 31 African countries stands at 17.9% which is far more than the current performance of 13%. Even though Nigeria has the lowest tax-to-GDP ratio of 6% in Africa, it is a large producer of crude oil that makes up the shortfall in tax revenue and has a bigger economy than Ghana.

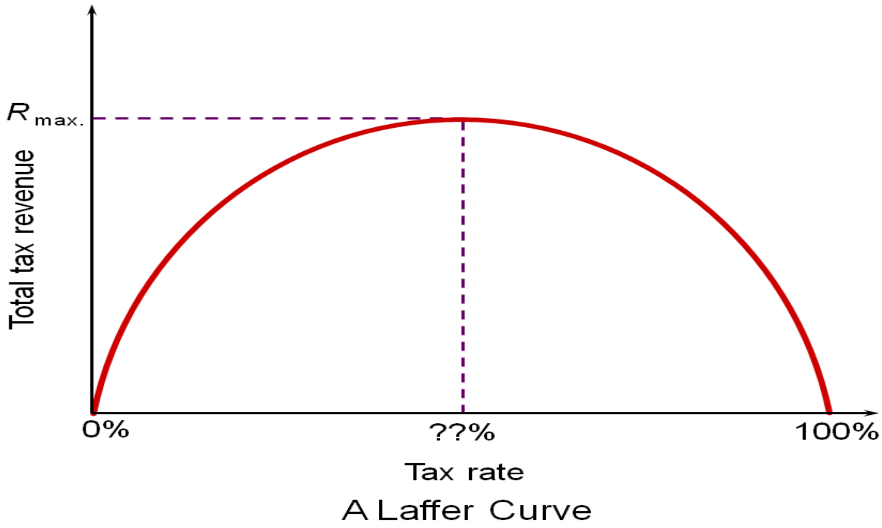
Figure 7. Tax revenue of Ghana to UK average.




*Source*: World Bank data (2024)

From Figure 7, we can observe that the 2003 HIPC deal with the IMF continues to be consistent throughout our analysis. Most of the country's good performance was experienced during this time and then began to relapse. According to the country's finance ministry, since 2000, higher corporate and personal income taxes, as well as VAT and other similar taxes, have contributed significantly to Ghana's growth in tax revenues; however, the growth of these two taxes has more recently slowed. Over 70% of all collections in 2019 came from these fees, up from 57% in 2000 (Ministry of Finance, 2021). Instead of finding innovative ways of broadening the tax net to capture the informal sector, governments continue to overburden the already existing taxpayer. This has led to a decline in tax-to-GDP ratio from 2000 as predicted by the Laffer curve (as depicted in Figure 8). As tax rate continue to increase, revenue also increases and then begins to fall at a certain maximum tax rate. People naturally begin to find ways of evading taxes when they feel they have paid enough or not getting the value of their taxes. The tax-to-GDP percentage in Ghana is on average for sub-Saharan African nations. Ghana's tax revenue collections, however, are relatively low when compared to nations around the globe with comparable income levels: in 2018, Ghana was ranked 26th out of 36 lower middle-income nations for which data were available (Ministry of Finance, 2021).

Figure 8. Laffer Curve

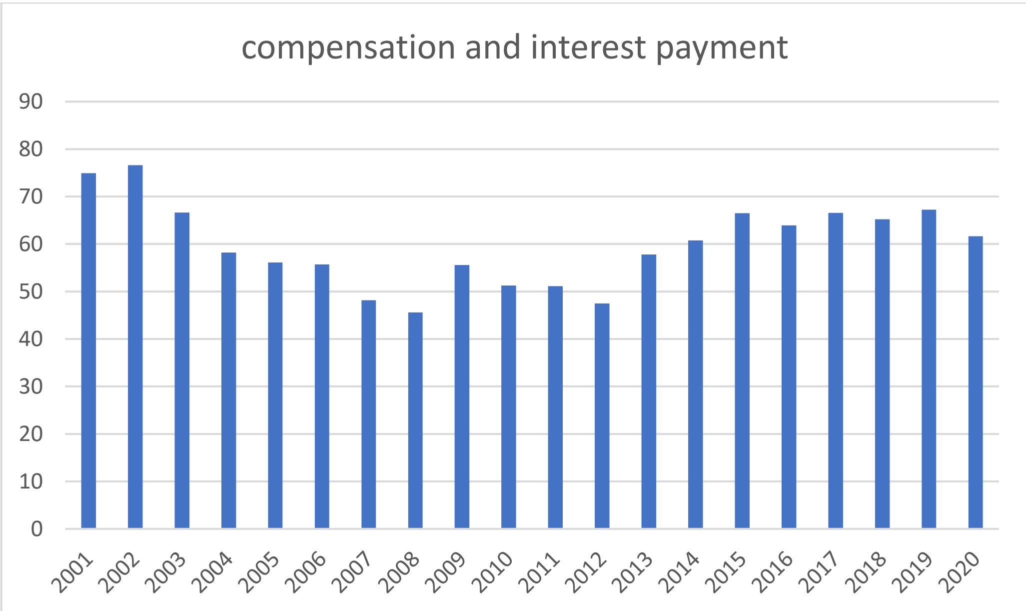



*Source*: Morton and Blair (2020)

## 6. Interest Payment and Compensation

Interest payment is one of the major components of Ghana's expenditure along with compensation of employees. Due to persistent borrowing and a history of default, the country tends to borrow at a very high interest rate which has further compounded its debt situation. Over the past decade, interest payment and compensation of employees has taken a chunk of the country's domestic revenue. For instance, in 2022 the government anticipates spending a total of GH¢70 billion out of the estimated domestic Revenue of GH¢90 billion on interest payment and compensation alone. This means 73.6% of government's budgeted domestic revenues will be consumed by interest payment and compensation of employees (vaultnews, 2021).

Figure 9. Compensation and interest payment as a percentage of total expenditure




*Source*: World Bank data (2024)

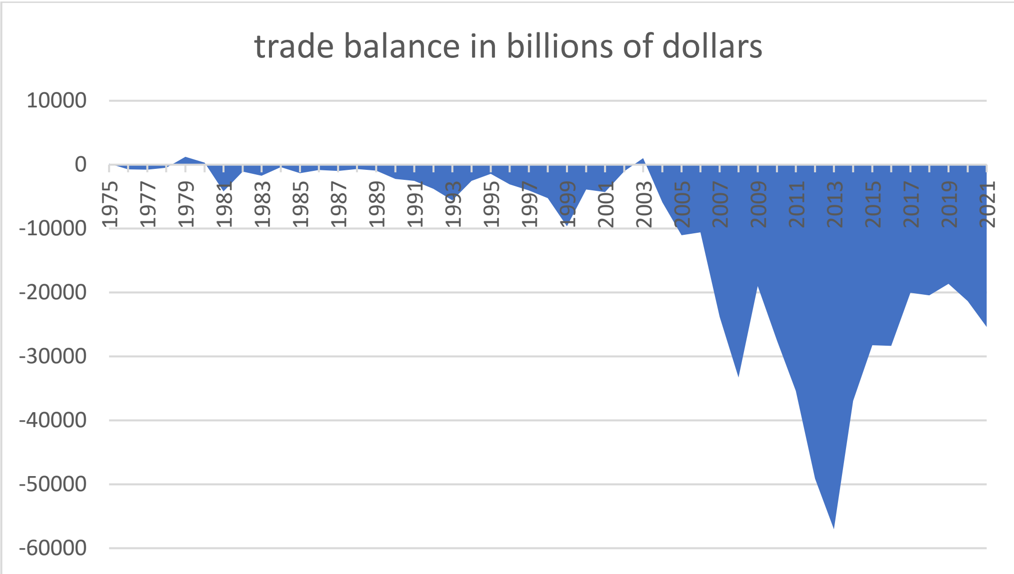
This situation created, gives the government tight fiscal space to operate. In 2014, the IMF proposed a freeze on public sector wages as a condition before a staff level agreement could be achieved. However, it was a net freeze in the public sector employment that was agreed on (myjoyonlne, 2014). Similarly, in 2023, as the government negotiates with the IMF, the government has decided to put a total ban on public sector employment before an agreement could be reached (Annang, 2022). Even at 60%, it is clearly unsustainable for a small country like Ghana to develop and invest in infrastructure.

## 7. Balance of Payment and Exchange Rate

Balance of Payment (BoP) measures the total import and export of goods and services between one country and other countries. As an import driven economy, Ghana has consistently maintained a negative BoP. The effect of negative trade balance on local currency depreciation however cannot be discounted. Since most international transactions are done in foreign currencies like the dollar and the British pound, the local currency has continued to depreciate against these major trading currencies due to trade imbalance. Consistent depreciation of the cedi and hyperinflation led to a redenomination in 2007.

For instance, in 1982, the US dollar was exchanged for 2.78 cedis, two decades later, it was exchanged for 9100 cedis (Mansa, 2007). In the redenomination exercise, the government decided to knock off four zeros off the currency in other to allay fears off excessive depreciation and restore investor confidence. One U.S dollar was then set at 0.91 Ghana Cedi. Since the redenomination exercise, the Cedi has lost value of about 150%. According to (International trade administration, 2022), since the beginning of 2022, the Ghanaian cedi's value relative to the U.S dollar has fallen sharply. Between January and October 2022, the cedi fell more than 55%, one of the biggest drops of any currency in history. It has also been reported by the Chamber of Bulk Oil Distributors that the Central Bank has been unable to provide its members with enough forex to import petroleum products. This tends to put pressure on the local currency as demand for dollar increases. The fall in the value of the Cedi has negative impact on the general macroeconomic indicators of the country. For instance, once the cedi falls, imported goods become more expensive leading to inflation and the value of accumulated debt also increases.

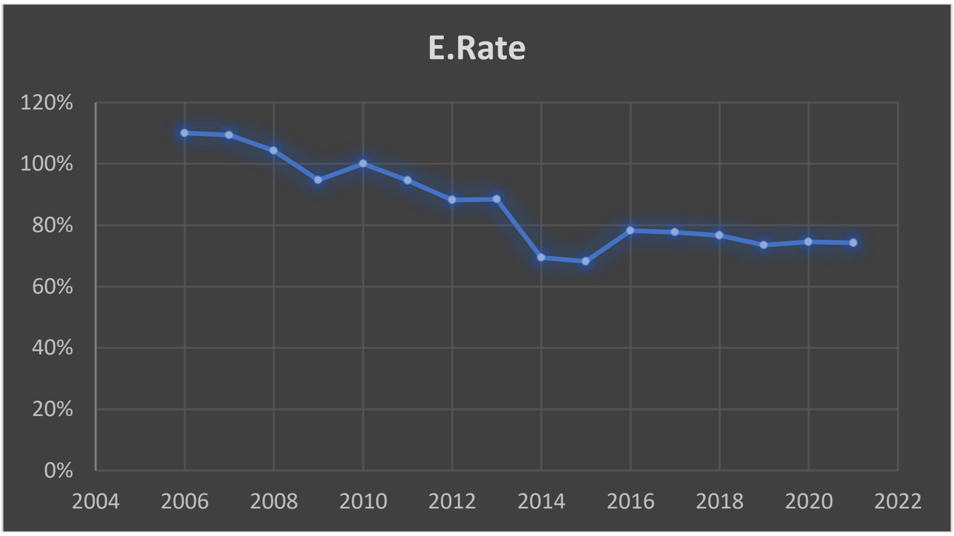
Figure 10. Trade balance (1975-2021)




*Source*: World Bank data

From the above graph, the country reached an all-time low of BoP in 2013. This has been partly attributed to the 2013 fall in world commodity prices (Frankel, 2014). The two major export commodities of the country, gold and cocoa were also affected. Ghana has been a net exporter of crude oil which was one of the major hits of the global crisis. These together affected the income receipts as opposed to payments in that year. The country has however taken measures to address its balance of payment deficits. For instance, the Bank of Ghana stated that importation of rice, poultry, vegetable oil, toothpicks, pasta, fruit juice, bottled water, ceramic tiles, and certain other products will no longer receive foreign exchange support since same products are produced locally. We can acknowledge that the worse depreciation recorded in 2015 can partly be attributed to the huge trade imbalance in 2013 and 2014 from Figure 11. As BoP improves in the subsequent years, depreciation has also been relatively stable (Figure 11).

Figure 11. Cedi Depreciation (2010=100)

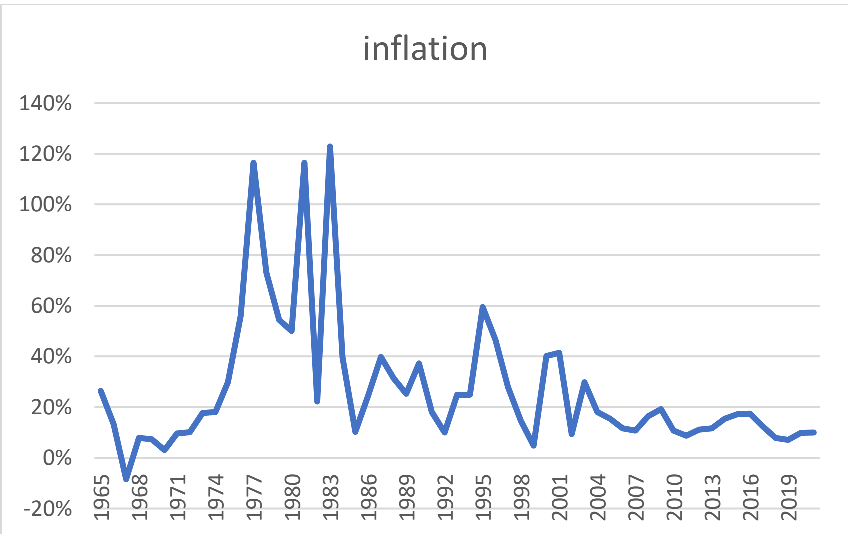



*Source*: Bank of Ghana data (2024)

## 8. Inflation

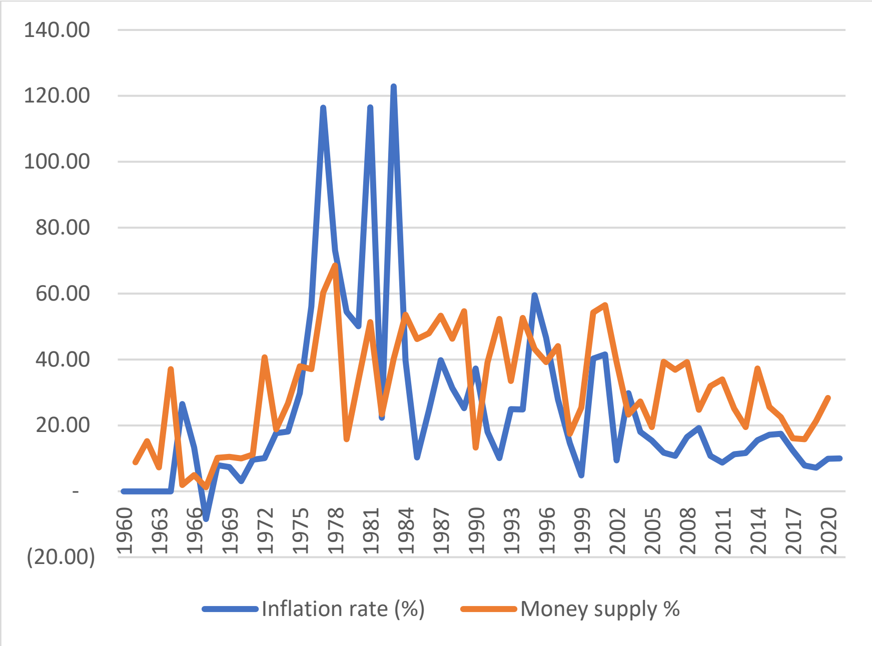
Even though double-digit inflation might be unfamiliar to many developed countries, for many developing countries, it is the norm. in severe economic downturns, it gets even worse to three digits. In Ghana's case, the country has experienced three-digit year on year inflation in three separate periods since independence. First was in 1977 during the country's military rule when inflation reached a peak of 116%. The country was mostly unstable during this time with negative economic outlook. Inflation reduced since then but was mostly over 50%. In 1980s, the country returned to three-digit inflation in 1981 and 1983 with inflation rate of 117% and 123% respectively. The country was still grappling with consequences of the military takeover from 1970s through to 1980s. 2001 was the most recent time Ghana experienced a three-digit inflation. The economy was crippled with huge debt and poor governance. Despite all these, inflation has been relatively stable in the 2000s but has been double digit. Similarly, even though unofficial, there have been reports of inflation reaching 100% in 2022 by various news portals. This is because, the government over spent their budget by over 15% in 2019 which was more than the average budget deficit of its neighbouring countries of 5%.

Figure 12. Inflation performance




*Source*: World Bank data (2024)

Figure 13. The relationship between broad money growth and inflation rate.




*Source*: World Bank data (2024)

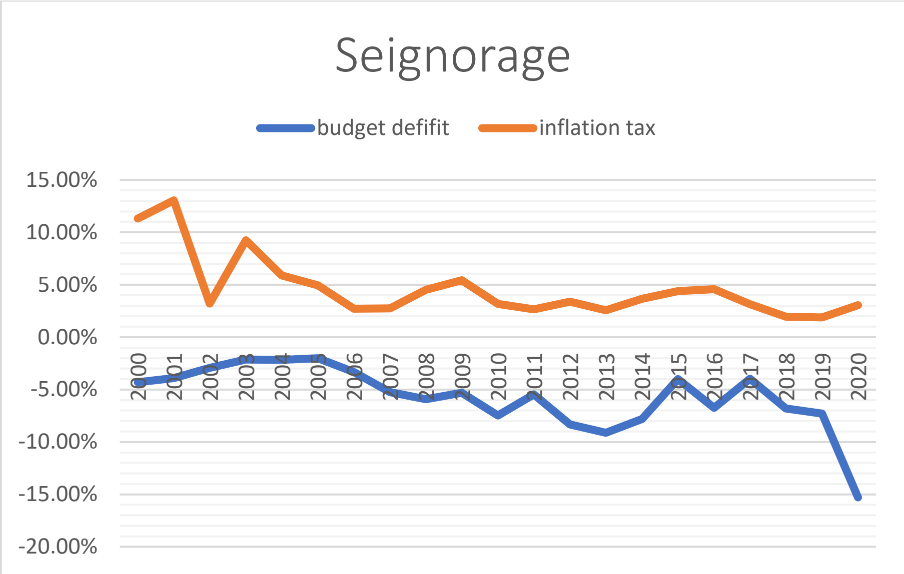
## 9. Seigniorage (Inflation) Revenue

Due to the instability characterized by the 1970s through to 1990s in Ghana, we will only limit our discussion on seigniorage taking data from 2000s in other to better understand the concept. Seigniorage as defined by (Majaski, 2022) is the difference between the face worth of currency and its production costs. To put it another way, the expense of creating a currency within a specific economy or nation is less than the actual exchange value, which typically benefits the governments that print the money. Many governments around the world especially developing countries have use this mechanism to finance their budget deficit by printing and circulating money in the system. A well-known example will be the situation in Zimbabwe during Robert Mugabe's era. During this period, the annual rate of price growth in 2008 was 11.2 million percent resulting in citizens abandoning the local currency and adopting the dollar (Kadzere, 2008). The government of Zimbabwe at that time decided to consistently print money to finance its budget deficit. The short run objective was achieved. However, the long run effect of this policy on the economy has proven to be devastating.

Even though the situation in Zimbabwe was a special case, Ghana on the other hand has also experienced its worse form inflation since independence. Just like many other developing countries, Ghana has in times past printed money to finance its budget with the most recent one being August 2022. By responding to allegations made by a section of the public and some opposition in parliament, the Bank of Ghana stated that the support of about $2 billion it supported the government budget with wasn't new currency printed but represented net claims on government bonds and stocks (ghanaweb, 2022). In other to understand the impact of money supply on inflation, we use the seigniorage equation below also known as inflation tax.

$$\text{Seigniorage} = \frac{\text{inflation Rate x Money Supply}}{\text{Actual GDP}}$$

Figure 14. "Tax" revenue through printing of money




*Source*: Ghana ministry of finance and World Bank data

From the above figure, between the periods of 2006 to 2010, we can see that an increase in budget deficit led to corresponding increase inflation tax. Same thing can be said for 2011 to 2015. We can therefore conclude that there is a positive relationship between budget deficit and inflation tax. As government attempts to print money to finance its deficit, it creates inflation by doing that and subsequently gains revenue from it as an inflation tax.

In data, we can see that there is a strong correlation between inflation, seigniorage, money supply and trade. 57% correlation between trade and inflation proves our earlier analogy that part of the country's inflation is imported due to trade imbalance. We can also conclude on the negative effect of money supply on inflation. Even though the correlation isn't that strong, it might be because of the use of M2 equation of money in our analysis which takes into consideration the use of electronic money, credit card etc. However, most transactions in Ghana are done in cash. Therefore, using M1 equation of money would have shown a strong correlation with inflation. Another interesting fact is that there is a 72% strong correlation between the budget deficit and trade. This shows that as budget deficit increases, trade deficit also increase and vice versa. It is also important to note that, public debt correlates strongly with compensation and interest payments at 77%. This means that due to the country borrowing at high interest rates, it also compounds our debt levels.

## Conclusions and Further Research

By combining historical data with modern economic challenges, this study on Ghana's budget, debt, and inflation cycle takes a fresh perspective and offers a thorough understanding of the nation's economic dynamics from 1960 to date. Its uniqueness is in the way it examines these interrelated aspects in Ghana's particular setting in detail, providing insightful information for policy makers. This study is important because it reveals trends and correlations that policymakers had previously overlooked or missed, which will help them make better decisions regarding debt management, inflation targeting and fiscal policies.

Even though the challenges listed above are peculiar to many developing countries, it is evidently clear that there are structural problems with the Ghanaian economy that needs to be looked at before economic prosperity can be achieved. Many analysts and politicians have identified the problem but have done little to tackle it or perhaps, the political will is lost. Ever since independence, governments have been unable to wean themselves from the Guggisberg economy it inherited in the colonial era. Nothing gets produced in the country. The country has been exporting raw gold and cocoa for centuries which brings very little foreign exchange as compared to the amount it spends on import.

According to ( Akorlie & Aboa, 2022), being the second-largest producer of cocoa in the world after Ivory Coast, Ghana annually uses loans from foreign banks mostly to finance bean purchases. In 2022, Cocobod, Ghana's cocoa sector regulator, signed a $1.13 billion cocoa syndicated loan with some foreign banks. These further burdens the accumulated debt and the interest on these loans are repaid in dollars which tends to put pressure on the local currency. In other to tackle the consistent fall in the local currency and put an end to imported inflation, the government must tackle the root cause by improving its manufacturing sector. This will tackle the unemployment and inflation problem in the country. The continuous tax increment on existing ones have proven futile and unproductive. Therefore, in other to improve revenue mobilisation, it is important for the government to invest hugely in areas that are not captured in the tax net. This will rake in more revenue and reduce reliance on foreign donors and printing of money to finance budget deficit. There is certainly hope for Ghana, however it needs strong commitment and hard decisions.

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My sincere appreciation goes to all the members of the department of Economics at the University of Lincoln for the rigorous training and discipline instilled in me throughout my graduate studies. The unwavering support (emotional and financial) from my family has been the backbone of my academic achievement without them this wouldn't have been possible. (Abdul Majeed Seidu).

## Credit Authorship Contribution Statement

**Abdul Majeed Saidu**: Investigation, Formal analysis, Writing – original draft, Data curation, Validation, Visualisation

**Aleksandar Vasilev**: Conceptualization, Investigation, Methodology, Project administration, Supervision, Writing – review and editing

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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## Appendix: The major fiscal and monetary events in Ghana between the period of 1960-2022

1967 Ghana experienced its first Coupe leading to years of political unrest.

1983 Ghana enters its first IMF program to address severe economic problems including high inflation and debt.

1986 Because of declining commodity prices, excessive inflation, and significant debt, Ghana's economy was having trouble.

1991 Economic Crisis due to fall in commodity prices leading to high inflation.

1995 Fall in commodity prices leading to economic decline.

1998 Large public debt accumulation leading to economic crisis.

2001 Ghana decided to join Heavily Indebted Poor Countries (HIPC)

2009 Debt crisis

2010 Power crisis

2013 Fiscal Crisis (IMF)

2014 Power Crisis

2015 Fiscal Crisis (IMF)

2017 Banking Crisis

2018 Debt Crisis

2019 Debt Crisis

2020 present Economy struggling due to COVID-19 and excessive borrowing

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# Green Finance Supports Sustainable Environment: Empirical Approach towards Applicability in Tourism Sector

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**Abstract:** ***Purpose***. *Sustainable development Goal (SDG)-2030 is an important agenda of UN. Green finance concept is a way to support sustainable development goal. This research explore concept of green finance toward green industry in India. The aim of this study how green finance help in increase of green industry in Indian region focusing on the tourism sector specifically.*

***Methodology.*** *The study based on empirical research structure equation model constructed with help of SPSS and AMOS software. Data collected from respondent those are related to manufacturing company and availed green finance services from financial institute. Total 576 sample collected within Indian region.*

***Finding.*** *The study finds that green finance awareness, incentive, initiative and technology will increase green industry. The study finds that factors of green finance industries are green marketing initiative, green finance incentive, awareness about green finance and technology innovations.*

***Originality***. *The study based of five factor these are green finance marketing initiative, green finance incentive to investor, green finance awareness, green technology innovation and green investment. All these factors support green industry in Indian region and other region as well.*

***Practical implications***. *The aim of the study to fids out factors which increased green industry through green finance supports. The study related to finance services for green investment for sustainable society.*

**Keywords:** sustainable development goal; green finance; green industry; green investment; sustainable society.

**JEL Classification:** Q01; Q56; G41; R11.

## Introduction

Although there has been a rise in climate change, little is known about how businesses can grow correlation between their different types of financial routine and related operations. While there have been negative correlations discovered between green innovations with help of green financial. Prior research has demonstrated a significant positive influence of sustainability activities on organizations' financial operations. Green technology related with sustainable product and reducing carbon emissions. In India more enterprises are inclined toward green innovation. Consumers prefer green product and inclined toward green energy. Examining the connection between CO2 emissions and financial success can be made easier by integrating different viewpoints and calculating environmental innovation scores (Khalil, M. A., & Nimmanunta, K. 2023). Green financing encourages investment in renewable energy sources, lowers environmental risks, and increases corporate transparency. But it can have a bad effect on industries that pollute. This study examines, considering renewable energy kinds, nations, and policy stability, how green finance affects innovation in renewable energy at the economic level. It uses entire green bonds, which extends the results of recent studies.

Central bank played huge role in green finance economic to mitigate pollution in the society. Policies toward green finance of central bank is right step toward sustainability. Number of financial instate have implemented different type of policies for green finance which not only provide sustainable environment but also encourage people to adopt sustainable product. On the other hand, opinions differ on whether central banks should assist in the expansion of green finance or to what degree existing operating frameworks should take climate change into account. The policy environment in which central banks operate is being altered by the coming climate crisis, and climate change has a substantial impact on both their primary functions and their larger role in mitigating and managing climate change-related risk (Dikau, S., & Volz, U. 2021). With an emphasis on green spaces, fintech innovation plays a critical role in lowering environmental emissions. The idea of a "green environment," which entails fewer pollutants and carbon footprints, has gained popularity. Fintech innovation, which includes digitalization, paperless transactions, and credit market innovation, boosts efficiency in financial processes. As a result, less paper is wasted and gasoline is used for transportation, improving the environment. Green investments can be encouraged, and sales of green credit can be increased by both public and private financial institutions. The expansion of environmentally friendly capital and financing may result in a rise in the green environment. The key objectives of the study are mentioned herewith:

a. To examine relationship between Green Banking marketing initiative and Green finance investment.

b. To analysis relationship Green finance incentive and Green finance investment.

c. To analysis relationship Green finance awareness and Green finance investment.

d. To examine relationship Green technology innovation and Green finance investment toward adoption of green finance industry

## 1. Literature Review

The agenda of united nation to reduce overall temp of earth by 2030. This can be possible through sustainable energy products. The Sorbonne Accord will not be achieved without $1.55 trillion in annual green investment from the UNFCCC through 2040. For developing financial systems, long-term viability is a critical concern. Research on responsible finance prioritizes long-term fixes, like clean energy share benchmarks and green bonds. Nevertheless, obstacles to renewable expenditure implementation, including administrative costs and manageable deficits, impede the growth of green financing in nations like Nepal. This study uses an integrated approach that includes patent citation and subjective evaluation of sample papers to focus on green finance knowledge and its application from theory to practice (Mohsin, M., Dilanchiev, A., & Umair, M. 2023).

A developing idea, "green finance" takes governance, social, and environmental aspects into account while making investments. The green finance is important e to reduced carbon emissions in society which help to sustainability. The agenda of green finance to increased green investment and developed sustainable economic in society. Legislators can use the research's valuable context to inform their regulations of GEPI's green finance. The literature review, research design, empirical analysis, and summary comprise the four aspects of the study. Green finance optimizes economic structure, improves supply-side quality, and maintains sustainable economic growth. It encourages green innovation, drives consumers toward environmentally friendly consumption, and reduces market transaction costs. Green finance drives ecological civilization by stifling energy-intensive, high-pollution enterprises and bolstering environmentally conscious ones. Since it can do so steadily and permanently, it is crucial for fostering rural development and lowering poverty. The administration of the Yangtze River Delta aims to promote ecological civilization, green development, and environmental governance through green financing. It is crucial to look into the characteristics and factors that influence the growth of green finance in order to progress the field.

The G20 nations ought to support the expansion of the worldwide market for green investments, with a focus on developing or underdeveloped regions. Public institutions and regulations can aid in the development of new markets, such as those for green bonds and other sustainable infrastructure finance products. The G20 may potentially establish tax and regulatory frameworks to channel capital into non-liquid, long-term green investments made through yieldcos and other investment trusts. Additionally, the G20 should ensure that developing countries align their financial institutions with sustainability goals and provide technical assistance to them while they construct national roadmaps for sustainable finance. One way to do this is to use the Green

Invest platform to share experiences. Some of the important literatures reviewed in this direction can be stated as below.

Table 1. Important Literatures

| Sl | Author and year of publications | Method | Outcome of study | Variable used in study |
|---|---|---|---|---|
| 1. | (Ibrahim, R. L .et al., 2023) | Data collected from Various countries | Growing greenhouse gas emissions are posing a serious threat to the globe, with natural resources playing a major role. A study looks at how CO2 emissions are affected by gas, coal, and oil in ten of the most resource-dependent nations between 1995 and 2019. The study discovered that while natural resources increased CO2 emissions, the effects were mitigated by technology, structural change, renewable energy, and green finance. Reducing subsidies for fossil fuels and boosting investments in renewable energy are the study's recommendations. | Green House Gases, Technology, Green Finance |
| 2. | Tariq, A., and Hassan, A. (2023) | GM methodology used for analysis of data | Using a panel dataset of 70 countries, the study looks at how environmental legislation, carbon finance, renewable energy, and green finance affect environmental sustainability. The findings indicate that while carbon finance has little effect on sustainability, green finance and renewable energy have a major influence. The renewal energy is an important factor to reducing carbon emission. The study recommended to boost renewal energy sources. | Green finance, indexed carbon |
| 3. | Wang, R., *et al.* (2023). | Least Square method | This study included sustainable finance toward green energy and green innovation. The study focus on OECD countries for financial support toward sustainability. The study collected data within OECD region. Energy efficiency, however, only works in the short term, and human capital has a major negative impact. The report suggests enhancing the performance of the financial sector to promote trade that is environmentally benign, boost energy efficiency investment, and improve inclusion. | Green finance, Energy, financial inclusion |
| 4. | Wang, K. H., *et al.* (2022). | Secondary data method | The study investigates the global causal relationship between sustainable development (SD) and green financing (GF). The results validate interaction theory by demonstrating that GF positively affects SD in several subperiods. On the other hand, there isn't any solid proof on which way GF influences SD. According to the report, governments and international organizations should direct risk avoidance and high-quality green investment. Additionally, countries can contribute to sustainable development by enhancing GF classification guidelines and information dissemination. | Sustainable finance, Green economy, Green financing, sustainable development |
| 5. | Lee, J. W. (2020). | Primary Data | The study examines how green financing fits into China's aims for sustainable development, taking governance, social, and environmental issues into account. Trends, difficulties, suggested policies, and the functions of the public and private sectors are all identified. This research encourage for all sectors, including policy development, market transparency, and the encouragement of private-public partnerships for the diversification of green finance. The study included recommendations about green industry and green the banking system, green bond market, and | Green finance awareness and its implications |

| Sl | Author and year of publications | Method | Outcome of study | Variable used in study |
|---|---|---|---|---|
| | | | green institutional investors. | |
| 6. | Liu, *et al.* (2021). | Primary data | This study looks at how Green Finance affected the development of high-quality economies in thirty Chinese regions between 2009 and 2019. It gauges the overall influence ratio of the green market and the degree of development of green finance using epsilon-based metrics and entropy techniques. Within a single research framework, the study integrates green financing toward green industry concept, renewal energy sources and green innovation. The findings indicate that green finance is decreasing gradient-wise, with upgrading industrial structures and technology innovation acting as intermediaries. In this relationship, environmental control has a non-linear role. | Green finance investment factors |
| 7. | Zhang, B., and Wang, Y. (2021). | Primary Data | With an emphasis on the financial, environmental, and economic facets of green finance development, this study proposes an evaluation method. It divides the development into three subsystems using the PSR model and computes evaluation scores. The system examines the growth of green finance in China between 2004 and 2017, highlighting its potential to advance the development of sustainable energy. | Green industry establishment factors |
| 8. | Huang, H., and Zhang, J. (2021). | Primary data | From 2011 to 2019, the study evaluates how green financing policies affect the environment in 30 administrative regions at the province level. The findings indicate that green finance pilot projects improve environmental quality and lower pollution. The relationship between industrial structure and innovation capability is somewhat mediated. Pollution in eastern and central regions is greatly reduced by green financing policy, but it is hardly reduced in western regions. | Green finance investment factors |
| 9. | Cui, H., et al, (2020) | Primary Data | To examine the effects of green finance on sustainability and cleaner production, this research proposes an evolutionary game model encompassing governments, financial institutions, businesses, and consumers. According to the model, sustainability and cleaner production are positively impacted by the integrity of the green finance system. A sustainable green finance system must prioritize tightening government control, cutting production costs, and raising consumer remuneration. | Green finance innovation technology |
| 10. | Dörry, S., and Schulz, C. (2018) | Secondary data | This essay investigates the connection between regional companies pursuing sustainable business practices and the banking sector. It investigates if financialized finance, which is hostile to alternative economic methods, may be used to manage green assets in a way that promotes sustainability. The interaction between the finance sector and entities that prioritize sustainability, like cooperatives and regional banks, is also examined in this article. The paper examines the private, public, and international financial centers involved in green financing using the local economies of Luxembourg as an example. | Green finance investment factors |

*Source*: Secondary Data.

Green bank marketing initiatives (GBMI) is defined by various authors. According to Peattie and Charter (1999) green marketing is universal executives process which responsible for recognizing, predicting and substantial the requirements of all stakeholder in the society in a sustainable manner. A type of banking known as "green banking" (GB) takes social and environmental considerations into account to conserve the environment and natural resources. For industrial initiatives that produce the most carbon dioxide emissions, it is a major source of finance. However, obstacles include high operating costs, diversification problems, start-up, reputational risk, and credit hazards impede the banking industry in Bangladesh from developing GB. Lack of finance, target market identification, customer persuading, and lack of understanding have all been found to be major obstacles to GB product development in studies conducted in Pakistan and India. Lower client trust, resistance to using new technologies, and a lack of awareness, education, and expertise among banking personnel regarding green banking practices are among the issues facing developing countries like Bangladesh. Green banking initiative reduces these issues. (Zhang, X. *et al.* 2022).

**H1. Green Banking Marketing Initiative (GBMI) increased green finance investment toward adoption of green finance.**

Green banking incentives are related with green services which directly befitted to consumers and society. In 2016, the United Arab Emirates launched green policies aimed at the financial industry, requiring all financial institutions to implement a Green Banking (GB) framework. However, because of several obstacles and difficulties, the uptake of GB technology by consumers and commercial enterprises is still inadequate. According to a nationwide survey conducted by UAE-MoEW, only 4% of consumers have a green account, and less than 38% of consumers have implemented GB technology transactions. The adoption rate of most green services has been quite low. This emphasizes the necessity for additional study on the obstacles influencing consumers' intentions to embrace GB technology in the UAE, since ignoring this problem could have serious negative effects on sustainability and financial losses (Bouteraa *et al.* 2023).

**H2. Green finance incentive (GFI) increased green finance investment toward adoption of green finance.**

Green finance awareness is a way to availed the opportunity for investors and other stakeholders in the society. Embracing green ideals can lower expenses, minimize fraud, and improve operational efficiency in banking. For businesses and banks to have enduring connections, green investment is essential. But more dedication to green investments is needed to meet global environmental targets. Inadequate funding for green initiatives may impede this aim. Green financing could be enhanced by creating regulations that encourage green credit and renewable energy production subsidies. The economy and green finance both benefit greatly from the provision of green credits for environmentally friendly initiatives that reduce pollution. Lack of proper documentation is one of the obstacles preventing banks from funding green projects. Consumers now prioritize banks that are environmentally conscious and accountable. Including environmental concerns in marketing campaigns can increase customer loyalty and improve the public's perception of banks (Ibe-enwo, *et al.* 2019).

**H3. Green finance awareness (GFA) increase increased green finance investment toward adoption of green finance.**

Technology is an essential element for driver of any organisation. Green technology innovation is indicators of green finance investment. Lending money to environmentally friendly development initiatives and green growth in the economy is referred to as "green finance." It consists of green funds and banks that assist with clean development projects. Renewable energy projects are financed by green bonds and banks in industrialized nations. The finance sector must include the Sustainable Development Goals into its development and investment strategies in order to prevent environmental catastrophes. Green banking practices encompass a range of activities such as green marketing, investment, internet, mobile, paperless, branchless, green ATMs, green buildings powered by renewable energy, and green communication. By using these procedures, banks can improve their environmental performance and lessen pollution and environmental harm (Ellahi, A. *et al.* 2023).

**H4. Green technology innovations on green finance services increased green finance investment toward adoption of green finance.**

The adoption of technology-oriented services is significantly influenced by gender, with females favouring green and sustainable growth. The use of mobile banking is more common in women. Customer decisions are also influenced by societal standards, utility, and convenience of usage. Green development is becoming more and more competitive in developing nations like India. Sustainable development can be aided by raising public knowledge of green banking practices. Corporate Social Responsibility (CSR) is a marketing tactic that the automotive industry is using more and more to keep customers and increase market value. However, there are a number of reasons why it can be difficult to conceptualize CSR in particular contexts. The goal of "green finance," also known as "green investments," is sustainability with the least amount of adverse effects on the surrounding area and environment. The automotive industry should uphold sustainability standards by offering reasonably priced funding for projects that aim to increase the sustainability of society while taking economic factors into account. Banks in Bangladesh should use eco-friendly practices to lower environmental dangers. Green banking regulations are being adopted by developing nations including Bangladesh, Pakistan, and India; nevertheless, implementation may be hampered by stakeholder pressure and financial gain. While foreign banks are already putting eco-friendly plans into practice, Pakistan's banking industry is at risk because of a lack of environmental knowledge and awareness.

**H5. Green Banking marketing initiative (GBMI) increased growth of green industry.**

Green economy agreements incorporate social and environmental factors into business operations with the goal of enhancing both individual and community well-being. The green growth strategy in Indonesia encourages investments in renewable energy, landscapes, and environmentally friendly infrastructure. To improve state civil servants' competency in green growth and government institutions, cooperation and sincere contributions are required. The globalization of green growth and sustainable development is necessitating a change in financial paradigms. To encourage ethical investing and corporate social responsibility, the financial system must be changed. To determine national characteristics and development priorities for financing green growth and sustainable growth, a variety of methods are employed, including observations, economic descriptions, structural and logical analysis, and systems analysis. To reconcile social, economic, and environmental performance, banks need to achieve sustainable growth. The use of mobile or branchless banking has increased significantly in the twenty-first century (Marhaeni, A. *et al.* 2023).

**H6. Green finance incentive (GBI) increased growth of green industry.**

Globally, green finance has difficulties, particularly in developing nations that depend on the production of oil and natural gas. Major concerns include disagreements over credit estimation, knowledge discrepancies, structural variables, external impacts evaluation, and principles. Green finance has various advantaged while providing awareness to all stakeholders. This awareness led to adoption a positive step toward adoption of green products in society. Low returns, high implementation costs, and a lack of talent are problems faced by developing countries. The epidemic has caused the focus of green development and sustainable growth to move from quantitative to qualitative factors, requiring a new finance and investment model as well as an overhaul of the economic environment. Through sustainable consumption and production, sustainable development seeks to deliver prosperity to the entire world. A UN resolution by 2030 established 17 main objectives for sustainable development. In order to lower environmental risks and maintain the health of ecosystems, the green economy idea advocates for significant policy changes on social, economic, and environmental issues. (Zheng, G. *et al.* 2021).

**H7. Green finance awareness (GFA) increases growth of green industry**.

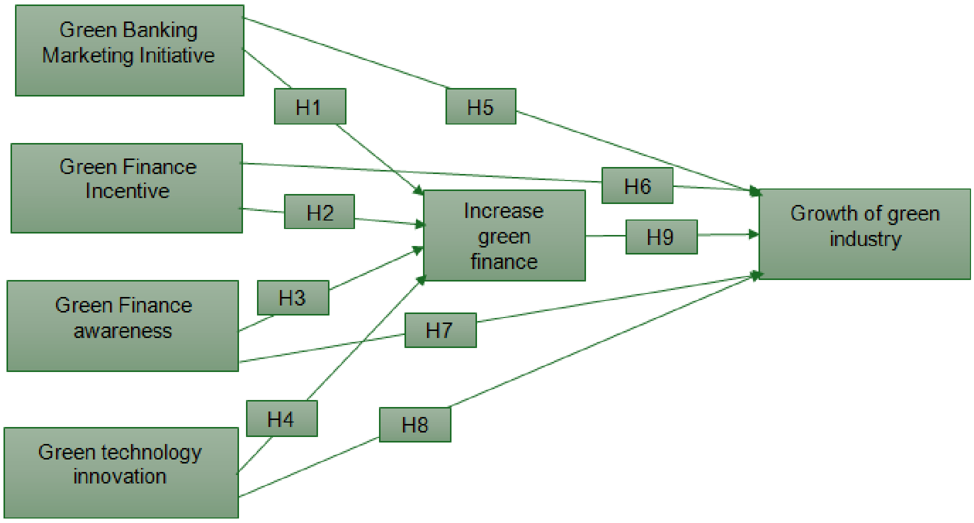
The circular economy (CE) is a business strategy that seeks to reduce waste, maximize resource consumption, and create a profitable company in a cutthroat industry. However, financial constraints and a lack of available technology can be obstacles to implementing CE standards. Adopting Green Finance (GF) and Green Infrastructure (GI), two crucial ideas that are becoming increasingly important as the world's population struggles with climate change and environmental degradation, is necessary to successfully implement circular practices. When we talk about green finance, we're talking about giving money to projects and activities that promote environmental sustainability, such energy-efficient buildings, sustainable transportation, and renewable energy. It aids in raising money to finance environmental sustainability-related projects and the shift to a low-carbon economy (Agrawal, R., *et al* 2023).

**H8. Green technology innovation increases the growth of green industry.**

The green concept in the financial system is becoming more and more trendy among investors, legislators, and academics. This includes different type of products in term of bonds, investment related with social welfare, and financing for industry related with green concept. Three main categories may be found in the literature on sustainable finance *i.e.*, make fundstoward sustainable, the drawbacks of these kinds of funds, and a comparison between sustainable and conventional investments. Green bonds are a useful hedging tool, particularly in times of crisis like the current pandemic. However, Bangladesh's operational shortcomings and high transaction costs are impeding the expansion of green financing. Local, national, and international funding for climate change adaptation and mitigation is referred to as "climate finance." (Sharma, G. D. *et al.* 2022).

**H9. Green finance investment increase growth of green industry.**

Figure 1. Structure Model for Research




Source: Researcher's Assumption based model

## 2. Methodology

The study conducted in India fromstakeholders who have taken green services from bankor financial institutions. The respondents were related to manufacturing company within Indian region. The criteria set for the respondents are based on green services taken by investors. The respondents wererelated with green financial investment and green finance products. Data wascollected through onlin survey with help of well structure questionnaire. The questionnairewas set in easy and understandable language. Random sampling techniques used for collection of data. Total 576 samples collected from various respondent. Likert 5-point scale used for data collection and analysis of result. A well-structured questionnaire was prepared for collection of data. Initially, the pilot study conducted for validation of the questionnaire. Questions are related with green banking initiative, green finance incentive, green finance awareness and consumers' feedback. The questionnaire was floated in month of Dec 2023 and data was collected till Jan 2024. Initially questionnaire floated to 825 respondent and finally 576 feedback received from consumers.

## 3. Research Results

Table 2. Demographic Profiling

| Category | Variable | Number | Percentage |
|---|---|---|---|
| Gender | Male | 375 | 65.10 |
| | Female | 201 | 34.90 |
| Age | 18-30 | 52 | 9.02 |
| | 31-40 | 126 | 21.88 |
| | 41-50 | 187 | 34.46 |
| | 51 and above | 211 | 36.64 |
| Education | Undergraduate | 125 | 27.70 |
| | Graduate | 53 | 9.20 |
| | Postgraduate | 102 | 17.70 |
| | Other | 84 | 14.58 |
| Geographical Location | Urban | 260 | 45.13 |
| | Semi-Urban | 231 | 40.10 |
| | Rural | 85 | 14.77 |
| Profession | Employed | 101 | 17.55 |
| | Self-business | 54 | 9.38 |
| | Other | 124 | 21.52 |

*Source*: Primary Data.

In the following table no. 3 the results for the KMO Bartle test is shown. This test was conducted to determine that data is sustainable for factor analysis. The result of KMO Bartle is 0.850. The appropriates value must be between 0.8 to 1. Result for the factors analysis must be more than 0.8.

Table 3. KMO Bartle Test

| KMO value | | .850 |
|---|---|---|
| Bartlett's Test of Sphericity | Approx. Chi-Square | 20613.194 |
| | Df | 325 |
| | Sig. | .000 |

*Source*: Primary Data.

Table 4 showing commonalities result. This is showing that each variable is explained by facets. High values indicate well-represented variables. Principal factor axis factoring establishes the initial values of the correlation matrix based on the squared multiple correlation of variables, reflecting the percentage of variance explained by maintained factors. The value of extraction is more than .631 which is correlated with the variance. The value is more than 500 which more that acceptable value for model fitness.

Table 4. Communalities Test

| Factors | Initial | Extraction |
|---|---|---|
| GFMI | 1.000 | .785 |
| | 1.000 | .794 |
| | 1.000 | .802 |
| | 1.000 | .818 |
| | 1.000 | .882 |
| | 1.000 | .900 |
| | 1.000 | .833 |
| | 1.000 | .815 |
| GFI | 1.000 | .834 |
| | 1.000 | .816 |
| | 1.000 | .838 |
| | 1.000 | .859 |
| | 1.000 | .796 |
| GFA | 1.000 | .631 |
| | 1.000 | .669 |
| | 1.000 | .747 |
| | 1.000 | .616 |
| | 1.000 | .757 |
| | 1.000 | .678 |
| GTI | 1.000 | .860 |
| | 1.000 | .638 |
| | 1.000 | .804 |
| | 1.000 | .648 |
| IGFI | 1.000 | .878 |
| | 1.000 | .875 |
| | 1.000 | .878 |

*Source*: Primary Data.

Table 5 showing variance explained. Columns for eigenvalues, variance percentages, and cumulative percentages are present in the table. The greatest amount of variance is explained by the first factor, which is followed by the next and so forth. Additionally displayed is the percentage of variance explained by each component. The percentage of variance that has been accounted for by all of the factors that came before is known as the cumulative percentage. Based on the common variance, the number of factors kept is represented by the extraction sums of squared loadings. The variance distribution following varimax rotation is represented by the rotation sums of squared loadings.

Table 5. Loading Factor Result of the Research

| Component | Initial Eigenvalues value | | | Sums of Squared Loadings | | | Rotation Loadings | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 10.564 | 40.631 | 40.631 | 10.564 | 40.631 | 40.631 | 6.776 | 26.062 | 26.062 |
| 2 | 3.668 | 14.109 | 54.741 | 3.668 | 14.109 | 54.741 | 5.669 | 21.803 | 47.864 |
| 3 | 2.893 | 11.128 | 65.868 | 2.893 | 11.128 | 65.868 | 3.677 | 14.143 | 62.008 |
| 4 | 2.346 | 9.023 | 74.891 | 2.346 | 9.023 | 74.891 | 2.957 | 11.373 | 73.381 |
| 5 | .978 | 3.763 | 78.654 | .978 | 3.763 | 78.654 | 1.371 | 5.273 | 78.654 |

*Source*: Primary Data.

The rotated factor matrix, which shows the correlation and weighting of the variables and factors, is included in the table. To improve readability, low correlations are eliminated using the blank (.30) option. The factor pattern and structural matrices are the same for orthogonal rotations. These elements were selected because they are important and pertinent to the study. Table 6 showing rotated component matrix of the research. The study divided into five factors. The result is showing result of rotated matric is more than .500. SPSS 26.0 used for the study. The suppression value is .400.

Table 6. Exploratory Factor Analysis

| | GBMI | GFI | GFA | GTI | IGFI |
|---|---|---|---|---|---|
| GBMI | .822 | | | | |
| | .834 | | | | |
| | .874 | | | | |
| | .804 | | | | |
| | .907 | | | | |
| | .882 | | | | |
| | .891 | | | | |
| | .833 | | | | |
| GFI | | .854 | | | |
| | | .838 | | | |
| | | .872 | | | |
| | | .887 | | | |
| | | .846 | | | |
| GFA | | | .731 | | |
| | | | .799 | | |
| | | | .861 | | |
| | | | .773 | | |
| | | | .716 | | .487 |
| | | | .765 | | |
| GTI | | | | .926 | |
| | | | | .796 | |
| | | | | .896 | |
| | | | | .804 | |
| IGFI | | .658 | | | .534 |
| | | .680 | | | .523 |
| | | .668 | | | .530 |

*Source*: Primary Data.

Table 7 showing result of default model and saturated model. The CMIN/ DF value shall be less than 3. The value of NPAR is 8, DF is 325 and P value is .000. In the study CMIN / DF value is 2.90. This indicates that model is fit. NPAR stand for number of parameter of each model. CMIN is chi square value.

Table 7.CMIN Result

| Model | NPAR | CMIN | DF | P | CMIN/DF |
|---|---|---|---|---|---|
| Default model | 8 | 2.0915 | 325 | .000 | 2.90 |
| Saturated model | 26 | .000 | 0 | | |

*Source*: Primary Data.

Hypothesis result

Since greenhouse gas emissions harm the environment and interfere with societal welfare, they represent a serious threat to sustainable development. GHG emissions are a result of human activity such as mining, industry, transportation, and energy production. Energy efficiency, green financing, and technology developments can all contribute to lowering greenhouse gas emissions and ensuring sustainable development. Green finance improves cash flows from financial institutions, which incentivizes environmentally friendly initiatives. Better technologies are introduced by technological breakthroughs for social and economic reasons, and energy efficiency lowers waste and use of energy. Achieving sustainable development goals, avoiding harmful energy usage, and improving energy efficiency all depend heavily on the production and consumption of renewable energy.

Table 8 indicated effect of one factor on the other factor. Total 9 hypothesis were selected for the study. According to model hypothesis are related to green banking marketing initiative, Green banking incentive for investor, green banking services awareness and green technology innovation which increase green banking financial investment and green industry. As shownin table all hypothesis supported. The research indicated that green industry would be more when focus initiative, incentive, awareness and technology toward green finance.

Table 8. Hypothesis Result

| Effect | B | T | P value | Support |
|---|---|---|---|---|
| GBMI-IGFI | .62 | 24.46 | 0.000 | Yes |
| GFI-IGFI | .43 | 18.26 | 0.000 | Yes |
| GFA-IGFI | .59 | 14.56 | 0.004 | Yes |
| GTI-IGFI | .52 | 12.51 | 0.000 | Yes |
| GBMI- GGI | .45 | 24.46 | 0.000 | Yes |
| GFI-GGI | .56 | 19.26 | 0.004 | Yes |
| GFA-GGI | .58 | 18.56 | 0.000 | Yes |
| GTI-GGI | .53 | 13.51 | 0.000 | Yes |
| IGFI-GGI | .59 | 12.41 | 0.000 | Yes |
| NFI= .97. CFI= .95 | | | | |

P value equal to less than .005

*Source*: Primary Data.

## 4. Discussion on the Findings

Sustainable development goal is a foremost agenda of UN which have to achieved by 2030. Green finance is a step to achieve SDG which assistance to investors and consumers toward sustainable business. The study find out factors of green finance which increase green industry and achieved sustainable business. Five factors selected for green industry which support by green finance. Green marketing initiative, incentive in green finance, awareness about green finance, technology innovation and investment in green finance are factors of the study. Green finance faces challenges on a global scale, especially for emerging nations that rely on the production of natural gas and oil. Disparities in knowledge, credit estimation, factors that inhibit structural growth, disagreements over green finance ideas, and difficulties evaluating external effects are among the issues that need to be addressed. Green financing has benefits, but it also has problems, such low returns, difficult processes, and little experience. Green projects are costly and inexperienced in the beginning. The ecological growth of green finance in various region of the world is hindered by various reasons, including insufficient skill, insufficient profit, intricate methods, and expensive performance costs. Many studies have examined the trends, challenges, and opportunities for green product which led to sustainable growth in economic system.

Total nine hypothesis were selected for model of the study. Data collected from different stakeholder of manufacturing company in India. The stake holder either deal with green finance service or invested in green finance. The study finds that green finance investment depends upon marketing initiation where consumer choose green finance product. The demand of green finance product would lead investment in green finance by investor. The study find that green investment would depend on incentives in green investment like clearance, tax incentive, easy supply process, reducing compliance process. The investor would include to choose green finance investment when they will get such type of incentives.

The study funds that there is need to awareness green finance for investors and consumers as well. The information about incentive, cost of product, durability and so many would lead to investment in green finance and also consumer will choose the product. The incentive about sustainable business will increased durable industry. The technology innovation is an important factor in green finance investment and green industry. The study finds that technology innovation in green finance e will more lucrative for investor and consumer as well. This will also reduce time and cost of product. The technology innovation related to sustainable process of product and sustainable supply of product in supply chain management'. The green finance e investment increase green industry which overall support to sustainable development goal. The green finance services not only benefit of investor but also convenience for consumer in terms of process of product wastage in society. A relatively new area of finance called "green finance" is dedicated to funding environmentally friendly investments. It is distinct from conventional banking methods in that it takes plans' sustainability and environmental risk management tactics into account. According to the UNEP, a sustainable financial system encourages the use of pollution-reducing technologies. Green finance, according to the People's Bank of China, is a strategy that brings private capital to environmentally and energy-conscious industries. According to the European Banking Federation, there are prospects for green insurance policies and bonds because green financing is not just about environmental or climate change-related issues.

## 5. Limitations of the Study

The study conducted in Indian region. However it can be applied in other region also. The study conduct on green industry factors which support sustainable development goal. The factors are awareness, initiative, incentive, and technology. The further study may be conducted on other factor also like consumer preference on green product, cost effectiveness, durability of product etc. The study used SPSS and AMOS for calculation of data. The other model and software can be incorporated in future study.

## Conclusion

Despite the implementation of green banking policies and regulations, inadequate project management by banks and other financial institutions has impeded the advancement of green initiatives. A young market and high transaction costs are two risks connected to green products. Furthermore, green equity funding is restricted by the lack of a suitable business environment and legislative framework. Green finance helps investors and the ecosystem even if it has complicated processes, low yields, and little experience. It is difficult to implement green finance, particularly in developing nations, due to a lack of agreement on the underlying principles, issues evaluating external effects, growth-stifling structural variables, gaps in competence, and difficulties calculating credit. Institutional barriers prevent green initiatives from receiving financing. Green industries supports renewable energy sources and conserve traditional energy sources. The study finds out how green finance support to increase green industry. The study selected five factors which increased green industry in the country *i.e.*, green finance initiative, green finance incentives, awareness about green finance service to investor and consumer, technology innovation toward green finance and investment toward green finance. The study finds that marketing initiative, incentive, awareness, and technology innovation support investment in green finance. Finally investment in green finance increased green industry in the country. The Study is based on empirical data which collected from manufacturing country in Indian region. The respondent either availed green service from bank or willing to availed green finance services for green industry. The study conducted within Indian region but applicable other region also.

As sustainability is the only formula of success for the unforeseen future today, assessing the importance and work towards the holistic implementation of green industries in modern-day businesses is the call of the hour. In this direction, our effort here can be proved as a key-impetus towards the understanding the prospects and challenges of the green finance initiatives so that different stakeholders can be collaborated together towards enhancing the green investment sector in India.

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## Credit Authorship Contribution Statement

**Rojalin Mohanty**: The author has contributed to field work, investigation, formal analysis, and writing of this article.
**Ansuman Samal:** The Co-author has contributed to conceptualization, development of instrument, methodology, project administration, data cleaning and analysis, as well as editing of the article.
**Rakesh Kumar:** The Co-author has contributed in field work, conducting online research, as well as data analysis.

### Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper and thus, the authors have no conflicts of interests to declare.

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# Does Remittance Inflow and Foreign Direct Investment Spur Economic Development in Developing Countries? Insights from Nigeria

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**Abstract:** *Given the rising inflows of remittance and foreign direct investment into developing countries, the study examined their importance on economic development in Nigeria using the ordinary least squares method and time series data collected from secondary sources, and the Error correction models (ECM) were estimated. Findings showed that remittances and foreign direct investment impacted positively and significantly on economic development and the exchange rate negatively influenced economic development. Thus, recommended that the government should remove strict transaction costs of remitting money to expand the overall inflow of remittances and more personal remittances should be encouraged for investment in human capital development. Additionally, improvement in the investment climate for existing and expected foreign investors, relaxation of the strict laws on profit repatriation, and the improvement in the macroeconomic environment by curbing security challenges, social unrest, and corruption will encourage foreign investors to increase their investments. It also recommends that the government take advantage of these inflows to stabilize the volatility of the exchange of the domestic currency.*

**Keywords:** remittance; foreign direct investment; economic development.

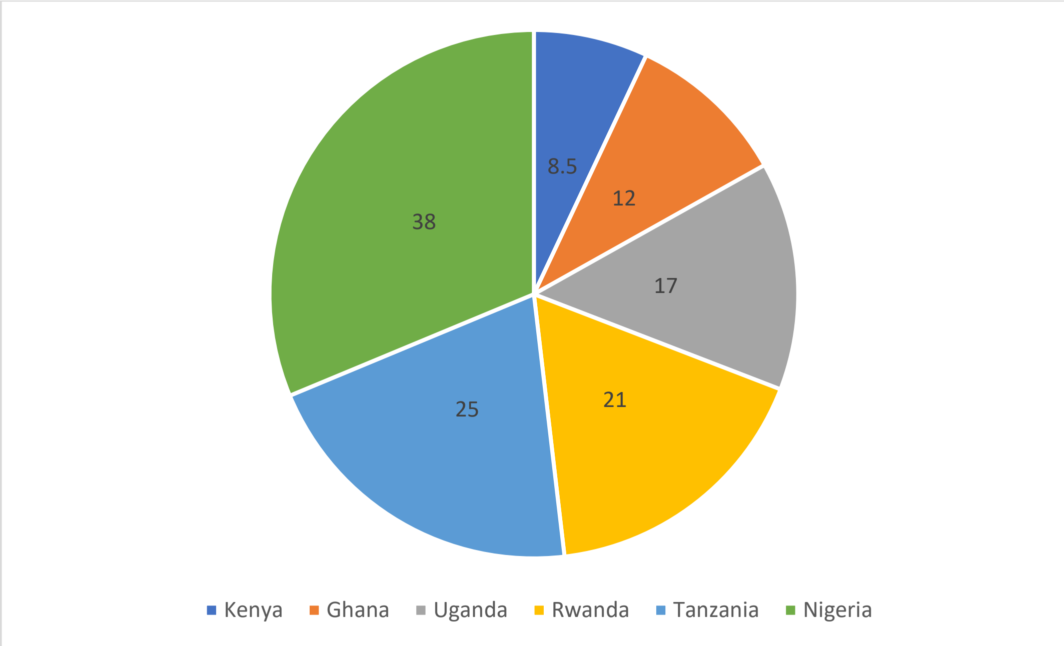
**JEL Classification:** F24; F21; F63; R11.

## Introduction

People work and send part of their income in the form of cash or goods to assist or give support to their households, relatives, and friends through different means or transfers as remittances. This provides a useful link between remittances and development constitutes part of the largest sources of income for low-income earners and increases the well-being of recipient households by improving their condition of living and consumption smoothing. Compared to foreign direct investment, remittances from the diaspora are seen as a significant vehicle in alleviating poverty and a channel of foreign exchange earnings to the country and act as protection against economic hardship to the recipient household.

According to IMF (2009), remittances lower poverty, raise welfare and supply foreign currency that assists countries in paying for necessary imports, service their external debt, and boost access to international capital markets. Commercial banks in some countries have utilized future progressions of remittances as a guarantee to generate finances at less expensive financing costs and longer maturities.

Figure 1. Remittance inflow to selected countries in Sub-Saharan Africa in Percentage




*Source*: Author's computation from World Development Indicators 2023

Remittance inflows to Sub-Saharan Africa increased in size by six percent in 2022 to $53 billion. The tendency was motivated by the remittance growth of twelve percent in Ghana, about nine percent in Kenya, twenty five percent in Tanzania, Rwanda, twenty one percent, and Uganda seventeen percent. Remittances to Nigeria, representing about thirty eight percent of total remittance inflows to the region, increased by three percent to $20.1 billion (World Bank 2023).

Prominence has been gained among researchers in the policy debate on the effect of remittances on growth, development and poverty. Studies in Nigeria on remittances from their consequences on economic growth and development such as (Agu, 2009; Adarkwa 2015; Adeyi 2015) effect on poverty (Adams *et al.* 2005; Ajayi *et al.* 2009; Fonta *et al.* and Olowa *et al.* 2013) amongst others are of the rationale behind the heightened interest in monetary remittances and the sharp rise in the number of remittances transferred to developing countries. Because of similar monetary policies by countries in the SSA, have considered large-scale foreign aid, as not only a source of solving the problem of developing countries but bridging the gap of resource unavailability (World Bank, 2019).

Dimensions of globalization that emerged with global flows are people, capital, goods and services. Capital flows include Foreign Direct Investment (FDI), remittances, Foreign Portfolio Investment (FPI), and Official Development Assistance (ODA). Personal remittances and FDI can prompt monetary dependability, advance supportable turn of events, and guarantee the prosperity of societies (World Bank, 2013). Policymakers and researchers are of the view that FDI aids the performance of host nations and encourages economic growth and development. The certainty about the credence of FDI is that it does not only give capital financing, in addition, brings in positive externalities by annexing foreign technology and technical know-how (Alfaro *et al.* 2004)

For many years, developing nations have continually expanded their share of FDI earnings and are now one of the largest sources of external financing for development. This is evidence of the relevance of FDI to economic development and has various expected advantages to be realised in the host economy. For instance, FDI is less unpredictable than other private capital flows and gives a stable source of finance to meet capital necessities in developing countries (Reisen & Soto, 2011). It serves as capital investments across national borders and contributes to growth and development through capital formation and transfer of new technology. In relation to lasting interest and long-term connection, FDI is viewed as a veritable source of global investment (Organisation for Economic Co-operation and Development, 2016).

Despite the effect of the COVID-19 pandemic, the initial rise and trend of remittance inflow and FDI to the economy and the impact of these inflows are supposed to appear in improving the lives as well as poverty reduction of Nigerians in the areas of Gross Domestic Product (GDP) per capita and human capital development.

But this seems an illusion given the worsening economic development indicators of Nigeria over the years. As indicated by the African Development Bank Group (2023), Real GDP growth decreased from 3.6 percent in 2021 to 3.3 percent in 2022, resulting from a decline in oil production and a shrinking in public consumption and net exports. Growth in income per capita decreased to 0.8 percent in 2022 from 1.2 percent in 2021 with Inflation peaking at a two-decade high of 18.8 percent, powered by energy and food price increases and traverse effects of exchange rate depreciation. The importance of these flows seems to be relevant for developing countries owing to the quest for financial need for development. The current situation of personal remittances and FDI is of major interest and their volume of fluctuation is of particular interest. The increase and imperative nature of the flows into the country heighten the question of their effect on development in Nigeria.

## 1. Literature Review

Adams and Page (2005) analyzed the effect of worldwide migration and remittance on poverty in emerging economies with data from 71 developing nations utilizing OLS and instrumental factors. Findings showed that remittances from migrating abroad can decrease the extent of poverty in the remittance-receiving country. While Okodua (2010) studied the relationship between remittances and economic development in 21 selected countries in sub-Saharan Africa (SSA). By employing the system Generalized Method of Moments (GMM) estimation technique and evaluating the connection between output growth and remittances, remittances and homegrown investment, and remittances and external trade balance, findings revealed that remittances hurt output growth, homegrown investment, and external trade balance.

To determine whether remittances can lead to economic growth and development, Joseph *et al.* (2014) investigated their effectiveness in household welfare and health care in emerging countries and their cause and effect between economic growth and remittances in remittance-receiving nations such as Nigeria, Senegal and Togo. Findings showed a unidirectional causal relationship for Nigeria and Senegal, and in Togo, no causal link between remittances and economic growth.

Applying Panel estimation methods, Goschin (2014) studied remittances as a factor of economic development with evidence from the Central and Eastern Europe (CEE) countries. The models were tested using aggregate data that covered ten countries. Findings showed a positive impact of remittances on relative and absolute GDP growth. In Bangladesh, however, Pradhan and Khan (2015) in their contribution to remittance earnings using the human development index and quality of life, found a long-run spontaneous relationship from remittances to HDI; indicating that remittance earnings have a long-run impact on the quality of life. On their part, Matuzeviciute and Butkus (2016) examined the impact of remittances on long-run economic growth covering 116 countries with dissimilar development patterns and found remittances to possess a positive effect on long-run economic growth, but the influence differs based on the country's economic development level and the abundance of remittances in the economy. In Cameroon, Ofeh and Ali (2017) studied the effects of remittances on Economic development with the least squares method of Multiple regression. Results revealed that migrant remittances insignificantly explained Economic development in Cameroon.

Employing a survey and logistic regression techniques, Ehinomen (2019) examined the impact of remittances on household well-being in southwestern Nigeria. Evidence showed that the household's ties with the remitter increase the likelihood of households being non-poor and an increase in the employment status of the remitter increases the probability of the household being non-poor. Oshota and Badejo (2015) found a significant impact of FDI and economic development and the values for individual remittance into the country reflected a positive impact on economic development in the economy and an increase in personal remittance spills over to an increase in economic development in Nigeria. Furthermore, in Ghana, Minta and Nikoi (2015) with emphasis on growth and poverty found remittances and human development index to be positively related to economic growth and development. However, remittances do not impact significantly on poverty reduction in Ghana.

Evidence from empirical findings showed that remittances may increase income inequality and reduce poverty. For instance, Lee (2020) found that FDI increases income inequality in Vietnam and the presence of a non-linearity relationship between FDI and income disparity was substantiated. Additionally, the investigation revealed that the impacts of FDI on income inequality are different depending on the level of education and institutions. Also, in Kosovo, Arapi-Gjini *et al.* (2020) with the dose-response function approach found that remittances reduce both relative and absolute poverty levels and lead to an insignificant growth in inequality.

Ngoc (2021) examined the link between foreign direct investment, human development and endogenous growth in 102 developing countries. Utilizing the two-stage least squares method and correcting for endogeneity and instrumental variables, the findings confirmed the role of foreign capital flows, human capital and institutional quality in fostering economic growth. The estimate is related to Orji and Mba (2010) who tested for simultaneity and the nexus between foreign flows, capital formation and growth in Nigeria. More so, Cleeve *et al.* (2015) on FDI and human capital in 35 SSA countries. Their Findings showed the extant relationship between FDI and human capital, market, and factor endowments, infrastructure and economic crises as the determinants of FDI.

Investigations have heightened arguments on the positive or negative effects of remittances and foreign direct investment. Coon and Neumann (2015) investigated the linkages between remittances and FDI in 118 developing countries and found increased in FDI inflows to lead to increase in remittances. Suggesting that migrant remittance and FDI are complementary. In confirmation that capital flows vary and are country-specific and their roles in economic growth, Javaid (2017) studied the effect of external capital flows such as remittances, FDI and ODA on Pakistan's GDP growth. The outcome indicates that FDI and ODA had an overall positive influence on GDP growth in Pakistan in both short and long run and remittances play no identifiable aspect in explaining the variations in economic growth. Additionally, the study by William (2018) in 109 developing countries found a positive effect of remittances on growth in efficient economies.

On the Impact of FDI, remittances and ODA on economic growth in developing countries, Zardoub and Sboui (2023) introduced the panel data approach and the results indicate proof of an uncertain impact of financial flows on economic growth. Findings also recommend the utilization of economic-type solutions to determine the defect encountered in the unanticipated effects. Intriguingly, Fagbola *et al.* (2020) inquired if FDI and remittance inflows constitute vital sources of economic growth in Nigeria. Evidence showed that FDI has a positive but non-significant effect on growth and remittances inflow has a negative and insignificant impact. However, Nwosa and Akinbola (2019) ascertained the substitutability effects of capital flows on economic growth and found that FDI and foreign aid are substitute investments in influencing economic growth, foreign aid and remittances are complement investments in producing economic growth and FDI and remittances are substitute investments in influencing economic growth in Nigeria. While Orji *et al.* (2019) found remittance and exchange rates to negatively impact on economic development in Nigeria in the long run.

Based on the studies reviewed, it is apparent that there is a dearth of research work done on this area with regard to economic development in Nigeria and most of the research on remittances are focused on its impact on poverty reduction and inequality, economic growth and labour supply. Irrespective of the increasing importance of remittance in capital flows, their nexus with economic development has not been sufficiently studied. However, this study seeks to investigate personal remittances and their nexus with foreign direct investment in accelerating development in Nigeria. Specifically, the objectives are to: examine the impact of personal remittances and foreign direct investment on GDP per capita and their effect on human capital development in Nigeria.

## 2. Research Methodology

The framework for the study is anchored on the endogenous growth theory. It postulates that people accumulate capital, then, learning by doing produces technological progress that may raise the marginal product of the capital, thereby offsetting the possibility for the marginal product to diminish when technology is unchanged. The major component of the model is the absence of diminishing returns to capital and investment. The model is expressed as:

$$Y = AK \qquad 2.1$$

Where Y = Total production in an economy
K = Capital

The nexus between remittance inflows, FDI and economic development has been identified in the literature but often contend that both remittance and FDI affect economic growth positively. The significance of remittance and FDI are identified as bridging the capital gap pointed out by Romer (1993) as obstacles cladding developing countries to catch up with advanced countries. The gap could be in human capital or physical capital.

### Model Specification

### Model 1

The model is specified as follows:

$$Y = A \cdot K\alpha \qquad 2.2$$

Where Personal remittance and FDI enter the model as capital, and A represents technology innovations.

$y = a + \emptyset\ REM + \beta\ FDI$

Incorporating other variables that impact output per capita and replacing *y* with *GDPPC*

$$GDPPC = \beta_0 + \beta_1 REM + \beta_2 FDI + \beta_3 GOX + \beta_4 EXR + \mu_1 \quad 2.3$$

Where:

$\beta_0,\ \beta_1,\ \beta_2,\ \beta_3,\ \beta_4$ are parameters to be estimated.

GDPCC = GDP per-capita income (measured as real per-capita gross domestic product in billions of Naira)
REM = Personal remittances are transfers from international migrants.
FDI = Foreign direct investment.
GOX = Government expenditure
EXR = Exchange rate
$\beta_0,\ \beta_1,\ \beta_2,\ \beta_3,\ \beta_4$ are parameters to be estimated.

**Model 2:**

$$HDV = \delta_0 + \delta_1 REM + \delta_2 FDI + \delta_3 GOX + \delta_4 EXR + \mu_2 \quad 2.4$$

Where:
HDV = Human capital development

$\mu_1, \mu_2$ = Error terms

The study data were obtained from the Nigerian Central Bank bulletin, Bureau of Statistics, and the World Development Indicators 2022.

## 3. Result and Discussion

### 3.1 Unit Root Test Result

The unit root tests result as revealed in Table 1 showed GDPPC, HDV, REM, FDI, GOX and EXR were all integrated of order 1. This implies that the variables are stationary at first difference. The ramifications of the unit root test results are that all the tried time series variables (*i.e.*, GDPPC, HDV, REM, FDI, GOX and EXR) are coordinated of order one, that is I(1).

Table 1. Augmented Dickey-Fuller (ADF) unit root tests result

| Variables | ADF Statistics | | Remark |
|---|---|---|---|
| | Level | First Difference | |
| GDPPC | 0.353498 | -26.80881** | I(1) |
| HDV | 0.129244 | -5.516743** | I(1) |
| REM | 0.187184 | -4.926507** | I(1) |
| FDI | 2.115634 | -4.632275** | I(1) |
| GOX | -0.636034 | -7.518593** | I(1) |
| EXR | 3.902410 | -5.096167** | I(1) |

*Source*: Author's computation with output from EViews

### 3.2 Co-integration Test Results

The Johansen test is carried out since the time series variables (GDPPC, HDV, REM, FDI, GOX and EXR) are of order of integration one (*i.e.*, I(1)).

Table 2. Cointegration test results for model one

| Hypothesized No. of Cointegrated Equation(s) | Eigenvalue | Trace Statistic | 5 Percent Critical Value | Probability Value** |
|---|---|---|---|---|
| None * | 0.731281 | 143.2576 | 69.81889 | 0.0000 |
| At most 1 * | 0.678439 | 92.00813 | 47.85613 | 0.0000 |
| At most 2 * | 0.568658 | 47.75999 | 29.79707 | 0.0002 |
| At most 3 | 0.312332 | 14.96669 | 15.49471 | 0.0599 |
| At most 4 | 0.009268 | 0.363153 | 3.841466 | 0.5468 |

*Source:* Author's computation with output from EViews.

From Table 2, it can be observed that the trace indicated 3 cointegrating equations at a 5% level of significance. In light of this evidence, it suggests a long-run equilibrating relationship between the variables in the GDPPC model.

Table 3. Cointegration test results for HDV model

| Hypothesized No. of Cointegrated Equation(s) | Eigenvalue | Trace Statistic | 5 Percent Critical Value | Probability Value** |
|---|---|---|---|---|
| None * | 0.814950 | 157.0546 | 69.81889 | 0.0000 |
| At most 1 * | 0.630655 | 91.25648 | 47.85613 | 0.0000 |
| At most 2 * | 0.573650 | 52.41150 | 29.79707 | 0.0000 |
| At most 3 * | 0.362184 | 19.16421 | 15.49471 | 0.0133 |
| At most 4 | 0.040828 | 1.625721 | 3.841466 | 0.2023 |

Cointegrating equations at a 5% level of significance indicated
*Source*: Author's computation with output from EViews

Table 3 shows the trace test statistics indicating 4 cointegrating equations at the 5% level of significance. This shows that a long-run equilibrating relationship exists between the variables that entered the HDV model.

### 3.3 Regression Result for Model 1

The error correction regression results for GDPPC model in Table 4 provide estimates of short-run and long-run dynamics of the time series variables in the model. The ECM coefficient measures the speed with which the system converges to equilibrium in the long run. The results showed that the coefficient of the one-period lagged value of the error correction term (*i.e.*, ECM(-1)) is properly signed and statistically significant at a 5% level of significance. The negative sign of the coefficient of the ECM(-1) indicates that the adjustment is in the direction of restoring the long-run relationship. The magnitude of the ECM(-1) coefficient (*i.e.*, 0.78) shows that the speed of adjustment is quite high as about 78% of the disequilibrium is corrected annually.

Table 4. Estimated error correction model for GDPPC

Dependent variable: $\Delta \widehat{GDPPC}_t$

| Regressors | Coefficient | Standard Error | t-Statistic | Probability |
|---|---|---|---|---|
| Intercept | 10330.49 | 4942.176 | 2.090272 | 0.0441 |
| $\Delta REM_t$ | 43.72410 | 14.89031 | 2.936413 | 0.0031 |
| $\Delta FDI_t$ | 32.34611 | 9.977320 | 3.241963 | 0.0002 |
| $\Delta GOX_t$ | 5.266131 | 1.633207 | 3.224411 | 0.0017 |
| $\Delta EXR_t$ | -0.865828 | 0.904463 | -0.857284 | 0.4504 |
| $ECM_{t-1}$ | -0.776762 | 0.096458 | -8.052852 | 0.0000 |
| $R^2 =$ 0.79 | | | | D.W = 2.04 |
| $\bar{R}^2 =$ 0.76 | | | | F-Stat = 26.16814<br>Prob = 0.000000 |

*Source:* Author's computation with output from EViews

The respective signs of the short-run variables in the error correction model for GDPPC conformed to the a priori expectations. With the exception of the exchange rate, all other explanatory variables (*i.e.*, personal remittances, foreign direct investment and federal government expenditure) impacted positively and significantly on GDP per capita in the short-run. The positive coefficients of REM, FDI and GOX imply that a percentage change in personal remittances (REM), foreign direct investment (FDI) and federal government expenditure (GOX) on average, increases per capita GDP by 43.72%, 32.35% and 5.27% respectively. Conversely, the negative coefficient of EXR suggests that a percentage change in exchange rate (EXR), on average, reduced the GDP per capita by 86.58 percent. The adjusted coefficient of determination showed that the estimated error correction model has a good fit as about 76% of the variation in GDP per capita was explained.

### 3.4. Regression Result for Model 2

Results for HDV in Table 5 showed that the coefficient of the one-period lagged value of the error correction term (*i.e.*, ECM(-1)) is statistically significant at a 5% level of significance. The magnitude of the ECM(-1) coefficient (*i.e.*, 0.92) indicates that the speed of adjustment is quite high as about 92% of the disequilibrium is corrected annually.

Table 5: Estimated error correction model for HDV

Dependent variable: $\Delta\widehat{HDV}_t$

| Regressors | Coefficient | Standard Error | Statistic | Probability |
|---|---|---|---|---|
| Intercept | 0.057747 | 0.009159 | 6.304667 | 0.0000 |
| $\Delta REM_t$ | 6.411138 | 2.725653 | 2.352148 | 0.0040 |
| $\Delta FDI_t$ | 5.947415 | 1.104695 | 5.383762 | 0.0000 |
| $\Delta GOX_t$ | 7.590625 | 1.930845 | 3.931245 | 0.0004 |
| $\Delta EXR_t$ | -0.001280 | 0.000448 | -2.859330 | 0.0072 |
| $ECM_{t-1}$ | -0.922134 | 0.037530 | -24.57027 | 0.0000 |
| $R^2 =$ 0.95 | | | | D.W = 1.95 |
| $\bar{R}^2 =$ 0.92 | | | | F-Stat = 122.7726<br>Prob = 0.000000 |

*Source:* Author's computation with output from EViews

The signs of the short-run variables conformed to the a priori expectations. Personal remittances (REM), Foreign Direct Investment (FDI) and Federal Government Expenditure (GOX) impacted positively and significantly on Human Capital Development (HDV) in the short run. Thus, a percentage change in REM, FDI and GOX on average, increased the HDV by 6.41%, 5.95% and 7.59% respectively. As REM and FDI increase, the receiving households will have other streams of income and could engage in other productive activities and employment. This agrees with the study by Minta *et al.* (2015), Pradhan *et al.* (2015) and Ehinomen (2019) who posit in their works that remittances and FDI are related to employment and quality of life. On the other hand, the Exchange Rate (EXR) negatively but significantly impacted on HDV such that a percentage change in EXR, on average, significantly reduced HDV by 0.13 percent.

## Conclusion and Recommendation

The analyzed economic development determinants such as personal remittance and foreign direct investment have emerged as an important component of foreign capital inflows needed for economic development. The study findings showed that personal remittances and foreign direct investment respectively impacted positively and significantly on economic development. This is an indication that in the long run, personal remittances and FDI improvements can stimulate the developmental needs of Nigeria.

Based on the above evidence, the study recommends that the government should remove the restrictions on remittances by reducing the transaction cost incurred in remitting money from foreign country, for example, fees for transferring and receiving countries such as Western Union, consequently bringing down the overall inflow of remittances. Remittances likewise come in types of tangible products which further braces the need to eliminate restrictions on remittance as implanted in emigration laws. It additionally recommended government exploiting the benefit of these inflows in stabilizing the unpredictability of the exchange of the domestic currency. It further recommends that government ought to improve on the investment climate for existing and potential foreign investors such as the regulatory frameworks on FDI and relaxing the strict laws on profit repatriation. This will spur existing foreign investors to increase their investments as well as attract new foreign investors. Government could improve the business environment by curbing security challenges, social unrest and corruption practices.

## Credit Authorship Contribution Statement

Authors have contributed equally to this work.

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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# Strengthening the Nexus: Policy and Legislative Reforms for University-Industry Collaboration in Kazakhstan

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**Abstract:** *The aim of this study is to examine the synergistic benefits that arise from collaborations between universities and industrial companies, examining the mutual advantages that both entities have. This research evaluates the government's efforts to cultivate such partnerships through a comprehensive documentary analysis of current policy documents and legislation. The findings indicate that a recently established ministry in Kazakhstan is actively developing proposals for legislative amendments to enhance the framework for collaboration between universities and industry. It is noteworthy that the government is providing tax preferences and incentives to industrial entities that collaborate with academic institutions, with the expectation that these measures will lead to beneficial outcomes. Despite these positive measures, the study* *revealed significant obstacles that prevent effective collaboration, such as legislative gaps and a general apprehension among industrial companies to set partnerships, due to the ineffectiveness of certain laws. The state's limited capacity to motivate participation from these corporations is what makes this reluctance a bigger challenge. This analysis highlights the necessity of strengthening political and legal frameworks to support more effective and productive collaborations between the university and industrial sectors. To bridge these gaps and improve the innovation ecosystem and drive socio-economic progress, this paper calls for a renewed approach to policymaking and legal reforms.*

**Keywords:** university; industry; collaboration, legal and policy acts, Kazakhstan.

**JEL Classification:** I23; I28; K15; L30; L33; R11.

## Introduction

This article explores the impact of collaboration between higher education institutions (HEIs) and industrial companies on the socio-economic development of the country, along with the challenges faced in forming these partnerships. Several official documents regarding the establishment and maintenance of this partnership have been released such as the “Concept for the Development of Higher Education and Science in the Republic of Kazakhstan for 2023-2029” endorsed by the Government’s decree. This concept emphasises the importance of boosting the scientific and innovative capabilities of regional universities, transforming them into key economic and innovative centres for their respective regions by means of attraction of the funds through the collaboration with industry. Promoting such collaboration had also been indirectly referenced in programmes approved by the Government before this. Furthermore, different motivations were considered for industrial companies to support scientific research. However, it is challenging to confirm the establishment of genuine collaboration between HEIs and industry, which successfully benefits both parties. We argue that the lack of collaboration is primarily a result of insufficient legislative support and the absence of coordinated efforts among government agencies. Thus, this article explores the legal and other challenges to fostering this collaboration and assess its feasibility in the context of Kazakhstan.

## 1. Literature Review

HEIs have been continuously enhancing their educational programmes through collaborations with industrial companies. They are training future specialists to meet modern demands, integrating scientific innovations into production, and evolving into innovation hubs. Scholars from different fields have extensively studied the advantages, benefits, and issues hindering the development of such collaboration. Indeed, the partnership between academic institutions and businesses is advantageous for both parties. Drucker and Goldstein (2007) have argued that universities have the potential to significantly impact on the local economy through entrepreneurial endeavours, innovative practices, and the commercialization of research results. They also stated that collaboration between industry and government can impact the creation of economic policies, plans, and initiatives. Thus, these partnerships can have a positive and considerable impact on establishing university-business research and development collaborations, which can boost economic growth (Altynbassov *et al.* 2017; Cunningham and Link, 2015).

Firstly, universities greatly benefit from this collaboration, particularly during periods of financial constraints from state funding. Forging collaborations with industrial companies provides access to extra funding opportunities (OECD 2019). These companies can offer financial support for training and scientific research, as well as opportunities to apply scientists' innovations and patents in production. Universities can provide a range of services to industry employees, including short courses, retraining, and skills development (OECD 2019). Moreover, taking into account recommendations from industrial companies can result in the revision of curricula and programmes, equipping graduates with the skills demanded on the job market. University instructors, students, and postgraduates will be involved in research on real-world issues, focusing on making research more practice-oriented. Senior management participation, alumni networks, and external communication have a favourable impact on university-business collaboration, resulting in enhanced corporate engagement in curriculum design and alignment with industry needs (Plewa *et al.* 2015). External funding for the universities can increase significantly due to such collaboration (Ankrah and Omar 2015; Sjöö and Hellström 2019).

Secondly, the partnership between academic institutions and businesses is advantageous for companies in the industrial sector. This opportunity allows for the training of specialised professionals, conducting research on industrial issues, and enhancing production quality with innovative ideas and intellectual property. University-industry research partnership benefits both parties, with corporations gaining access to innovative university research and academic members receiving funds and insights (Lee 2000). The establishment of partnerships between universities and technology parks is advantageous from an economic standpoint. This interaction offers high-quality training to experts who are dedicated to innovation in the primary areas of science, engineering, and technology development (Issabekov *et al.* 2022). Esteemed scientists and experts are able to facilitate scientific consultations, perform experiments in laboratories, and provide expert evaluations. Universities are ideal venues for hosting a wide range of meetings and business partner gatherings. Universities contribute to the worldwide expansion of the knowledge economy as well as the economic development of host cities through joint efforts on university premises (Benneworth 2007). Additionally, the partnership between universities and industry also has positive impacts on the community, specifically the local residents (Awasthy 2021; Alexander 2020). As a result, general public, in their role as consumers, could benefit from new products, high-quality goods, and services. By embracing new technologies and increasing tax contributions, industrial companies can help boost the region's economy, ultimately benefiting the local population. Such cooperation could also help tackle employment concerns. Industrial centres and local inputs can result in either steady-state growth in both regions or a core-periphery pattern in which growth is focused in one region (Englmann and Walz 1995). Thus, it is evident that collaboration between academic institutions and businesses brings significant advantages to all stakeholders involved. Undoubtedly, this subject has been extensively studied in the international scientific literature, revealing that the dynamics of partnerships between academic institutions and businesses differ based on the specific circumstances of each nation.

Universities play an essential role in innovation ecosystems by generating human capital, improving technology, and collaborating with business and local governments to drive economic development (Draghici 2015; Heaton *et al.* 2019). Modern universities go beyond traditional roles of education and research, actively engaging in turning innovative ideas into real-world applications through partnerships with industry. There are four key research streams in university entrepreneurship: entrepreneurial research, technology transfer productivity, new business development, and environmental context (Rothaermel 2007). For example, university research in the United States is founded on a close interaction between academia and economic activity, which leads to the formation of "on campus" or "spin off" firms based on research findings and knowledge (Quetglas and Grau 2002). Stanford University and the biomedical cluster in Boston, Massachusetts, represent the diversity of US innovation and its impact on HEIs (Powell *et al.* 2007). Silicon Valley is situated within the vicinity of Stanford University, where numerous large IT companies have set up offices (Adams 2005). These partnerships with universities have achieved global acclaim and financial self-sufficiency apart from government funding. Their private endowment funds surpass the yearly budget of certain nations. As an illustration, Harvard University boasts an endowment of $50.9 billion, followed by Yale University with $41.4 billion, Stanford University with $36.3 billion, and Princeton University with $35.1 billion. Entrepreneurial universities benefit the economy through teaching, research, and entrepreneurial activity, with the Russell Group of universities in the United Kingdom having the most impact (Guerrero *et al.* 2015).

It is evident that research universities, particularly knowledge-based activities such as teaching and basic research, have a significant positive impact on regional economic development (Drucker and Goldstein 2007). Fostering partnerships between academic institutions and businesses can boost the scientific and financial capabilities of universities. Industrial firms benefit from fresh concepts, resulting in cutting-edge manufacturing and improved financial effectiveness. Collaboration like this can be helpful for the local community, possibly addressing unemployment problems and offering access to new and high-quality products. However, there appears to be a shortage of research on this subject and a lack of studies assessing legislative acts. The Triple Helix model of university-industry-government relations demonstrates that economic interchange, intellectual organisation, and geographical restrictions drive innovation processes, with differentiation and performative integration allowing organisations to maintain wealth from knowledge (Leydesdorff and Meyer 2003). For example, university innovation has fostered local economic growth, with higher increases in employment, earnings, and company innovation following the Bayh-Dole Act of 1980 and federal research funding (Hausman 2020). Although the Bayh-Dole Act of 1980 considerably increased university-industry knowledge transfer and research collaboration in the United States, but implementing it in other OECD countries may have limited success due to structural disparities in higher education institutions (Mowery *et al.* 2004). Following this problematic interaction of university-industry-government in different contexts, this paper is focused on identifying and discussing gaps and contradictions in the legislation in Kazakhstan.

## 2. Methodology

In this study document analysis was utilized to explore the latest trends of collaboration between universities and industries in Kazakhstan. We have examined the legal and policy documents that govern these collaborations such as programmatic documents, institutional agreements, reports, and publications. Furthermore, documents pertaining to education, intellectual property, and collaborations between sectors and academia were examined (Bowen 2009). By adopting this approach, a thorough understanding of the different elements influencing the partnership between academic institutions and businesses was achieved.

To derive valuable insights from the data, the study employed thematic analysis (Braun *et al.* 2019). The acquired data was rigorously coded to identify repeating patterns, trends, and overall themes relevant to the research issue. The study aimed to not only examine the current level of collaboration between academic institutions and enterprises, but also to identify the critical aspects, challenges, and opportunities impacting this vital partnership by organising and arranging data from numerous publications. A thematic analysis allowed for a thorough examination of the various facets of university-industry collaboration in Kazakhstan, revealing patterns, legal limits, and political shortcomings related with the collaboration.

## 3. Results and Discussions

Analysing political and legal acts, the following findings have been drawn. The Government of the Republic of Kazakhstan has officially endorsed the "Concept for the Development of Higher Education and Science in the Republic of Kazakhstan for 2023–2029" by decree. It envisions regional universities transforming into scientific and innovative centres for their areas, establishing a strong connection between science, innovation, and production, with the industry supporting universities.

In 2023, the government has set more ambitious goals, seeking to open an additional six internationally renowned high-status campuses. Examples include the existence of international educational institutes in various locations of Kazakhstan. Notably, Heriot-Watt University established a campus at Zhubanov Aktobe Regional University. Similarly, Seoul National University of Science and Technology has partnered with Kyzylorda Korkyt-Ata Regional University, while the German Engineering Institute has set up a campus at Yessenov University in Aktau. Furthermore, Tianjin University has opened a branch at Serikbayev East Kazakhstan Technical University. In summary, the minister stated that Kazakhstan aims to accommodate approximately twelve branch campuses of various foreign universities by 2025 (MSHE, 2023). It should be noted that these collaborations have resulted not only in international/regional attraction of academic and students into the country, but also in unprecedented movement within the country. For example, universities students from the Northern regions are receiving students from far Southern regions who are willing to relocate for dual education for the first time ever. These are the clear examples of policy in action and responses to the present challenges of enhancing research focus, establishing international partnerships, constantly growing population, inner migration, supporting regional economies. For example, the government are welcome to negotiations with the companies to subsidise building projects for student residencies construction. Indeed, opening regional branches of leading universities boosts local and regional economic vitality through generating commercially viable knowledge, competent research scientists, and bringing talent to the local economy (Bramwell and Wolfe 2008; Uyarra 2010), impact on a variety of regional economic indicators, including teaching and fundamental research (Drucker and Goldstein 2007). For example, opening new university schools in Italy resulted in a 7% increase in the number of patents submitted by regional enterprises, owing primarily to high-quality scientific research brought to the region, referring that regional innovation activity increased in five years (Cowan and Zinovyeva 2013). In the context of Kazakhstan, the establishment of international campus branches, facilitated by recent shifts in higher education policy and legislation, has had a markedly positive impact on the growth of universities and their engagement with local businesses. Specifically, scholars have documented significant benefits for the local economy, tourism, and employment from the establishment of international branches in southern Kazakhstan (Bayanbayeva *et al.* 2023; Altynbassov *et al.* 2021; Altynbassov *et al.* 2022; Yessimova *et al.* 2023). By following the Triple Helix model of university-business-government partnerships, this collaboration has emerged as mutually beneficial (Etzkowitz *et al.* 1995). It not only strengthens the local economy but also enhances the capabilities and reach of higher education institutions (HEIs). Therefore, the current course of HE policy in fostering these international partnerships offers positive prospects for all the parties involved, indicating a mutual advancement of both academic institutions and the regions they inhabit.

Although attracting industry to the higher education system might seem like a simple concept from a legal perspective, laws and related acts have to be amended and supplemented in accordance to bring these ideas to life. Minister Sayasat Nurbek has highlighted in a recent interview that the Ministry of Science and Higher Education of Kazakhstan is working on proposals for amendments to normative acts to enhance collaboration between universities and industry sectors. As per the Minister, the Government is prepared to provide tax incentives of up to 150% and loans, along with other benefits, to encourage the industry to collaborate with the higher education sector. The proposals for amendments to normative acts are anticipated to be ready by spring this year, as mentioned by the Minister. Although these initiatives are well-timed and advantageous, given the extensive process of passing laws through Parliament, the necessity for consensus among other ministries, and their apparent lack of interest, the chances of these ideas becoming a reality appear low. Since most universities in Kazakhstan are state funded, they are depended on the allocated budget and state regulations which in turn stresses the importance of collaboration with the industry. Governments, industry partners, and private donors play crucial roles in funding and directing university research, with increasing emphasis on national and institutional research priorities, links with industrial partners, and commercialization of research inventions (Harman 2010). Higher federal support for universities results in fewer but more general patents, more high-tech entrepreneurship, and better researcher career prospects, whereas oil Use" of the Republic of Kazakhstan. As per this regulation, all companies in this industry must dedicate 1% of their investment to training and another 1% to scientific research. Nevertheless, the standards outlined in this Code are not yet fully in effect. No other law or legal act requires industrial companies to work with universities has been mentioned. While some ministries may have allocated budgets for training and scientific research, there is limited information available on whether these funds are actually reaching universities. In recent decades, state programmes have been approved by presidential decrees or government resolutions, emphasising the importance of cooperation between the industrial sector and higher education (Jumakulov *et al.* 2019). However, there has been no mention of financial support from businesses to academic institutions. Only in the last few years, there have been reports of some minor funding from industrial companies to local universities, facilitated by the enforcement of the "Code on Subsoil and Subsoil Use." This situation states the challenges in executing strategic initiatives focused on promoting collaboration between universities and industries in Kazakhstan. Despite the government's attempts to pass laws and provide incentives for collaboration, the practical implementation is hindered by bureaucratic processes and the necessity for a more united approach among different government entities and industry sectors.

Exploring the reasons behind the slow progress of collaboration between the industrial sector and higher education in Kazakhstan, as well as uncovering the obstacles to such collaboration, requires an initial analysis of the shared interests that could facilitate partnerships between these sectors. Examining global practices shows that the concept of universities and industry collaborating has emerged due to various compelling reasons, demonstrating mutual interest from both parties. For instance, publicly funded university-industry collaboration has a beneficial influence on UK firms' R&D expenditure per employee and share of R&D employment two years following project completion (Scandura 2016). Universities have demonstrated a need for partnerships due to various factors. Authorities globally have been promoting the collaboration between higher education institutions and industrial companies, resulting in innovations in education and science (OECD 2019). This partnership is expected to introduce fresh concepts to the industry, enhancing economic efficiency in industrial relations. Emphasising the social, innovation, and entrepreneurship functions of universities' third mission is crucial for the state, as highlighted by these policies (Guimón 2013). Additionally, the state's approach to enhancing universities' entrepreneurial skills is viewed as promoting the sharing of knowledge and solving real-world scientific challenges (Etzkowitz 2013). The success of industry-university collaborations is influenced by innovation, policymakers' eagerness to commercialise academic knowledge, and an innovative conceptual paradigm (Rybnicek and Königsgruber 2018). Furthermore, numerous countries have transitioned their higher education administration to a model rooted in neoliberal concepts, resulting in a gradual reduction of state support for higher education. This trend is evident in the budgets of universities in the United States (Saunders 2010), leading them to embrace a market-oriented management approach and endorse the entrepreneurial university model. With state funding on the decline, universities are turning to commercial ventures, increasing tuition fees, and forming partnerships with industrial companies to secure their financial future.

Although US academics are more open to university-industry collaboration, but many are sceptical of close commercial partnerships due to diminishing federal R&D funding and concerns about academic freedom (Lee 1996). The perceived threat to the researcher's freedom of research influences the decision to engage with industry (Tartari and Breschi 2012). Universities are more inclined to partner with industry if the company is mature and substantial, conducting exploratory internal R&D, and there are no significant intellectual property difficulties between the two parties (Cunningham and Link 2015). Whereas knowledge networks are underdeveloped in developing industries, and public funding for research initiatives is spread, making collaboration between universities and industries less feasible (Freitas *et al.* 2013). Factors influencing industry's readiness to engage with universities include industry capabilities, the incentive to build technological resources, and the intermediary's resources and procedure (Lai 2011). Similarly, in Kazakhstan, industrial companies may not be as enthusiastic about such collaborations. There are multiple factors contributing to this hesitation.

Initially, governments of many countries have been developing different normative acts and international agreements to guarantee industrial collaboration with universities. Academics from the Organisation for Economic Co-operation and Development (OECD) have suggested that OECD member countries include representatives of industrial companies in university governance bodies as external stakeholders (OECD 2019). Governments in OECD member nations supported these suggestions, diligently pursuing these goals. These nations are already economically robust, yet they consider such policies crucial at the intergovernmental level. In Kazakhstan, progress in this area has only started in the past two years. At the moment, only businesses engaged in subsoil activities must allocate 1% of their investment to training and another 1% to scientific research as per legal requirements. However, because of inconsistencies and deficiencies in the laws, progress in this area remains inadequate. In the business world, a company does not enter into a partnership through coercion; rather, it is a result of mutual interest and trust. Global practice indicates that companies typically only collaborate if it is financially beneficial or at least not detrimental. Certainly, industrial companies may have various reasons to be interested in such collaborations, which can come in different forms.

Nevertheless, there may be obstacles to establishing collaboration between universities and industries. First and foremost, the contrasting interests of the two parties can present a difficulty. Universities emphasise education and sharing knowledge, while industrial companies concentrate on competition and market dominance (Etzkowitz 2013). To address these conflicting interests, it is recommended to facilitate open discussions between the two parties, taking into account each other's interests to foster collaboration. Some experts suggest that industrial companies prioritise immediate returns on investments, while universities focus on long-term goals when collaborating (Saunders 2010). This is a legitimate concern, particularly in Kazakhstan, where equipment and tools at production sites are frequently imported, leading to challenges in incorporating local scientific products into operations due to high costs and time constraints.

Some Kazakhstani scholars believe that the industrial innovation programme aims to boost the scientific and innovative capabilities of the country's universities and necessitates international cooperation in science (Jumakulov 2019). They suggest that universities in Kazakhstan should expand their focus beyond traditional Soviet-era education and to align closely with the fields of science and industry. During the Soviet-era, science operated independently from universities and was mainly overseen by the Kazakh SSR Academy of Sciences. As a result, universities primarily concentrated on education and training. One viewpoint proposes that the lack of success in administrative reforms in Kazakhstan's higher education is partially attributed to a heavily centralised bureaucratic management system (Monobayeva and Howard 2015), characterised by widespread corruption and a deficiency in transparent and equitable governance. Consequently, centralised control hinders univesities' autonomy and their ability to achieve self-financing, which in turn complicates the establishment of collaborations between universities and industries.

## Conclusion

The study has investigated the obstacles and strategic requirements involved in fostering collaboration between universities and industries in Kazakhstan. Upon examining Kazakhstan's political and legal acts, various intricate issues have been uncovered concerning collaboration between universities and industries. As an example, ambitious goals are targeted in strategic documents such as the "Concept for the Development of Higher Education and Science in the Republic of Kazakhstan for 2023-2029." Yet, in order to bring the ideas suggested in this Concept to life, it is crucial to promptly and efficiently implement alterations to the current laws. This is essential in dealing with bureaucratic challenges and the effectiveness of government departments. One of the primary obstacles to fostering collaboration between universities and industries in Kazakhstan is the gaps and deficiencies in legislation and regulatory-legal acts.

Another important problem lies in the lack of coordination among state bodies, which hampers the effective execution of collaborative work programmes. Even though state policies at a high level acknowledge the significance of fostering partnerships between academic institutions and industries and establish specific objectives for this purpose, several challenges have been identified in effectively involving universities in these collaborations.

Dealing with administrative matters and advocating for moral standards are also essential considerations. The education and science sectors in Kazakhstan are plagued by a lack of transparency, eroding trust among public institutions, private enterprises, and educational institutions. Collaboration is needed from government agencies and leaders in the education and industrial sectors.

Another obstacle is the financial challenges faced by universities. Smaller private educational institutions face challenges with insufficient funding, which affects their capacity to recruit experienced educators and researchers. It is essential for universities to consider alternative funding approaches such as offering incentives to encourage the industrial sector to support education and research. Moreover, universities should explore alternative revenue streams such as commercialising research to enhance their financial autonomy.

It is crucial to align the objectives of universities with those of the industrial sector, as demonstrated by the study. Academic institutions are increasingly looking for external partnerships to boost innovation, address practical issues, and adapt to the decrease in state funding. This partnership is advantageous for all involved and helps advance education, economic prosperity, and societal advancement. Through this collaboration, universities transform into hubs for education and research, capable of commercialising their research discoveries, updating educational programmes to align with current needs, securing extra funding, and training sought-after specialists. Industrial companies can access state-of-the-art research, the newest technologies, and highly educated graduates; tap into fresh perspectives and creative ideas from university researchers; and gain a competitive edge through science-driven innovations, emerging technologies, and up-to-date knowledge and skills, all while boosting their corporate social responsibility. Ultimately, the partnership between universities and industries is a dynamic and multifaceted collaboration that goes beyond conventional limits.

## Credit Authorship Contribution Statement

**Sholpan Yessimova**: Conceptualization, Investigation, Methodology, Writing – original draft, Supervision, Writing – review and editing;
**Yerkesh Rakhymzhanov**: Investigation, Formal analysis, Writing – original draft;
**Bagdat Spanova**: Investigation, Writing – original draft
**Sulushash Baizhanova**: Investigation, Writing – original draft, Writing – review and editing;
**Marat Seidakhmetov**: Investigation, Writing – original draft, Writing – review and editing;
**Aiman Yessenova**: Investigation, Writing – original draft, Writing – review and editing;
**Bakhyt Altynbassov**: Conceptualization, Investigation, Methodology, Project administration, Formal analysis, Writing – original draft, Writing – review and editing.

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## Declaration of Use of Generative AI and AI-Assisted Technologies

The authors declare that they have not used generative AI (a type of artificial intelligence technology that can produce various types of content including text, imagery, audio and synthetic data. Examples include ChatGPT, NovelAI, Jasper AI, Rytr AI, DALL-E, etc) and AI-assisted technologies in the writing process before submission, but only to improve the language and readability of their paper and with the appropriate disclosure.

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# The Role of Emotional Intelligence in Making Successful Financial Decisions

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**Abstract:** *Emotional intelligence (EI) as the ability for self-analysis, self-motivation, and self-regulation is necessary in the process of financial activity. It ensures informed decision-making, considering consequences and perspectives. The aim is to identify the influence of emotional intelligence on the effectiveness of decision-making by financiers. The following tests were used: EQ (Emotional/Empathy Quotient) test, Melbourne Decision Making Questionnaire, the Rathus Assertiveness Schedule, the Schubert Risk Propensity Test. Statistical processing of the results included the use of descriptive analysis, ANOVA, and regression analysis. The study found that financial workers with a high level of emotional intelligence have a pronounced "vigilance" decision-making style ($F=113.4$, $p \leq 0.01$), high assertiveness ($F=103.3$, $p \leq 0.01$), and risk propensity ($F=137.3$, $p \leq 0.01$). It was proved that emotional intelligence explains the "vigilance" decision-making style ($\beta=0.943$, $R^2=0.572$), risk propensity ($\beta=0.896$, $R^2=0.424$) and explains 48% of assertiveness ($\beta=0.945$, $R^2=0.483$). It was confirmed that emotional intelligence is a predictor of successful financial decisions, it determines high assertiveness, vigilance, and risk propensity. Such results are useful for the development of training and retraining programmes for financiers. At the same time, including the development of assertiveness and risk propensity in professional and corporate training in parallel with the development of EI will give greater chances for the success of financial decisions. The obtained results are important for the financial and economic sphere, as they prove the effectiveness of EI in decision-making. This contributes to the improvement of the system of training competitive financiers and allows to expand aspects of the study of financial success.*

**Keywords:** emotional self-control; assertiveness; risk propensity; decision-making; emotional awareness; emotional finance.

**JEL Classification:** B26; G17; G41.

## Introduction

Today, economic development is a key mechanism that ensures the existence and productivity of society. The ability of economic systems to work effectively in most cases depends on the people who manage these systems. The competitiveness and instability of modern organizations require employees to have successful decision-making skills and readiness for difficult financial circumstances that are inevitable (Taffler, 2018). This is the reason why the ability of employees to make productive and effective financial decisions becomes important (Singh et al., 2021). This is facilitated by a high level of EI, which provides emotional awareness, sensitivity to other people's thoughts and emotions, and allows managing one's own emotional state (Drigas and Papoutsi, 2018; Ishchenko et al., 2023). EI is a practical means of achieving any goal in the modern world (Soliman et al., 2023). Being emotionally aware, an individual is able to productively plan ways to achieve goals (Schmalor and Heine, 2022). At the same time, emotional awareness allows adjusting the ways to achieve the goal, filter out secondary needs, and leave only important goals (Baker et al., 2022).

Emotional intelligence is a condition of a developed economic culture, a reflection of the emotional side of economic behaviour, which creates conditions for financial efficiency (Asmara, 2024). The developed EI helps to reduce financial risks, in particular, such an important component as understanding other people's emotions is important (Bucciol et al., 2021). It allows building effective interaction, which has a productive effect on the results of financial activities (Istianingsih et al., 2020). At the same time, the lack of EI skills can lead to incorrect financial decisions, which reduces financial success (Imam et al., 2022).

Many researchers prove the importance of EI for a modern specialist. In particular, in the financial sphere, EI contributes to the achievement of productivity in the provision of banking services (Wakawa, 2020). It affects the financial efficiency of organizations through the formation of employee confidence (Riaz and Shah, 2022). EI is the basis of self-regulation of financial workers, ensures the financial strength of the organization (Fachrudin et al., 2022), positive dynamics of financial decisions (Bouzguenda, 2018). It is noted that EI is the basis of emotional control, which is necessary for making rational and informed investment decisions (Irfan et al., 2023).

Summarizing all of the above, it can be stated that it is very important for modern finance specialists to have a developed EI, which ensures their emotional stability and self-control when making financial decisions.

The scientific novelty of the study is the study of the impact of EI on the effectiveness of financial decision-making, which qualitatively changes the approach to the organization of financial management and prospective modelling of the professional training of financial specialists. From a practical point of view, this significantly contributes to the training of financial managers since establishing the effectiveness of managerial decision-making depending on the level of emotional intelligence can provide valuable information about the results of financial activity and the means of its improvement.

Therefore, the aim of the study is to determine the effectiveness of EI in making financial decisions. The aim involved the fulfilment of the following research objectives:

1) Determine the level of development of EI components in financial workers;
2) Diagnose the predominant decision-making style of financiers with different levels of EI;
3) Compare risk propensity and assertiveness of financial workers with different levels of EI;
4) Prove the impact of emotional intelligence on the style of financial decision-making, assertiveness, and risk propensity.

The aim and objectives determined the research hypothesis, which predicts that EI affects financial decision-making, in particular, individuals with high EI have a predominant style of "vigilance", high assertiveness, and risk propensity.

## 1. Literature Review

A financial decision is a decision made regarding the finances of any organization. This is the choice of optimal sources of financing for entrepreneurial activity (Bogdan et al., 2018). The Expected Utility Theory (EUT) in finance has long been the basis for describing financial decisions. Its essence is that financial decisions were described as models of rational behaviour, while a person has an organized system of preferences and excellent technical skills for choosing optimal solutions (Ladrón de Guevara Cortés et al., 2023).

The theory of "emotional finance" has been very popular in recent decades. Emotional finance is a new paradigm in understanding investment activity (Alzoubi and Ramsha, 2021). This theory assumes that a person by nature is not a rational and thought-out, but an emotional being. Therefore, in most cases, a person is guided by his/her emotions, which can be both conscious and unconscious (Taffler, 2018). It follows that emotionally aware and stable employees can be more effective in the process of their activity (Dierks and Tiggelbeck, 2021). Accordingly, EI becomes especially relevant, which, according to some authors, is more important than cognitive intelligence (Santa et al., 2023). Emotional intelligence was first described by Salovey and Mayer, who equated it with general intelligence (Salovey and Mayer, 1990). The authors claimed that the developed EI increases the adaptive capabilities of a person through the regulation of emotions (Bru-Luna et al., 2021). Goleman (2011) noted that EI is the basis of leadership, as it represents the ability to recognize and understand emotions, control them, manage emotions for optimal interaction. EI provides stable self-control, the ability for constructive strategies of behaviour, tolerance to frustrations (Drigas and Papoutsi, 2018).

A high level of EI, which involves the control of emotions, increases confidence in one's actions and deeds (Karimi et al., 2021). In other words, EI in a certain way determines a person's assertiveness, persistence, and determination in fulfilling tasks. This is especially necessary in the financial field, where one important decision by an employee has implications for the entire organization (Jagriti et al., 2020). In addition, developed EI together with assertiveness have a positive effect on the coherence of actions in a team and making successful financial decisions (Chadijah et al., 2024). EI is a necessary quality of leaders for effective work (Cavaness et al., 2020). Understanding the fact that financial decisions are made by both ordinary employees and managers, we can say that EI is a particularly relevant quality of leaders. It embodies self-awareness, self-control, social skills, and resilience (Song et al., 2023). With these skills, financial leaders can flexibly manage conflict and manage change effectively (Quintillán and Peña-Legazkue, 2020). Therefore, EI supports the entire system of the organization, including the productivity of managers and the company's overall effectiveness (Alzoubi and Ramsha, 2021).

Emotional stability and management may also influence risk propensity (Sánchez-López et al., 2022). The risk propensity in the financial sphere is an important skill that allows making important decisions in the context of insufficient information or necessary conditions. Therefore, such a risk is justified, as it ensures the success of financial decisions (Branch and Berman, 2023).

Emotional awareness allows one to understand how emotions affect a certain decision in the long run (Lane and Smith, 2021). But despite the importance of the decision, EI plays a significant role in economic success (Ramchandran et al., 2020). Self-regulation as the ability to manage one's emotions is central to EI. This quality involves the ability to control impulsive behaviour (Laulié et al., 2023), to prevent unwanted emotional affects that can lead to incorrect financial decisions (Alarcón-Espinoza et al., 2022). Empathy builds effective interaction with the environment (Carminati, 2021), and skilful recognition of other people's emotions ensures constructive cooperation (Scott et al., 2010). After all, EI allows making sound, successful financial decisions and achieve big financial goals.

## 2. Methods

### 2.1. Research Design

The study lasted for 5 months from September 2023 to February 2024 in four stages. The first stage provided for a theoretical and methodological analysis of the problem, preparation for diagnostics, selection of methods. At the second stage, respondents were surveyed in Google Forms mode. During the third stage, a qualitative and quantitative analysis of the obtained results was carried out, the reliability of the obtained results was confirmed statistically. The fourth stage included justification of research conclusions, limitations and prospects.

The second stage involved surveying respondents through Google Forms. During the third stage, a qualitative and quantitative analysis of the obtained results was carried out, the reliability of the obtained results was statistically confirmed. The fourth stage provided for justification of research findings, limitations, and prospects.

The research was conducted using the Google Forms platform. The selected tests were entered into the forms and respondents were sent a voluntary invitation to undergo diagnostics. This ensured the usefulness of the study and allowed the respondents to complete the survey at a convenient time.

### 2.2. Sample

The study involved 280 respondents aged 28 to 45: 176 men and 104 re women. All respondents are financial employees of Oschadbank JSC. Of them, 76 employees of the Odesa branch (T. Shevchenko Ave., 11-A), 93 employees of the Odesa branch (Bocharova St., 53), 111 employees of the Kyiv branch (Holosiivskyi Ave. 92/1).

### 2.3. Methods

A valid and reliable standardized tools were chosen for diagnostics.

Emotional intelligence was measured using N. Hall's Emotional Intelligence Test (EQ test). The test is designed to detect a person's ability to perceive, understand, and express emotional states. The test includes the following scales: emotional awareness, self-regulation, self-motivation, empathy, emotion recognition.

Melbourne decision making questionnaire (MDMQ). The personal questionnaire is aimed at diagnosing the individual style in making decisions, in particular financial ones. The questionnaire contains 4 scales: vigilance, buck-passing, procrastination, hypervigilance. Only vigilance is considered a constructive type, the authors classify other styles as non-constructive.

The Rathus Assertiveness Schedule (RAS) is a self-assessment tool for determining assertiveness. The construct "assertiveness" at the time the test was developed was equivalent to the construct that later became known as "social skills." According to the technique, high positive scores reflect a high level of assertiveness, and high negative scores indicate low assertiveness.

The Schubert Risk Propensity Test (SACS)). The purpose of the test is to study the risk propensity in cases where it is appropriate. Positive answers to the test are a risk propensity indicator. In this case, risk propensity is considered the ability to make instant decisions that require operational analysis.

### 2.4. Statistical Methods

The research results were processed using descriptive analysis, univariate analysis of variance (ANOVA), and multiple regression analysis.

### 2.5. Ethical Criteria of Research

Informed consent was obtained from the respondents for conducting the survey. The subjects were familiarized with the purpose and tasks of diagnostics.

## 3. Research Results

The results showed a high level of emotional intelligence among financiers (Table 1).

Table 1. Indicators of EI in financiers (N=280)

| | | Emotional awareness | Self-regulation | Self-motivation | Empathy | Emotion recognition | EI |
|---|---|---|---|---|---|---|---|
| male | Mean | 11.59 | 16.17 | 15.11 | 11.85 | 15.15 | 68.16 |
| | N | 176.00 | 176.00 | 176.00 | 176.00 | 176.00 | 176.00 |
| | SD | 3.45 | 4.11 | 4.07 | 4.45 | 4.34 | 16.83 |
| female | Mean | 16.97 | 11.74 | 12.07 | 16.43 | 15.87 | 79.08 |
| | N | 104.00 | 104.00 | 104.00 | 104.00 | 104.00 | 104.00 |
| | SD | 2.87 | 4.38 | 3.13 | 4.40 | 3.34 | 13.77 |
| Total | Mean | 14.29 | 13.95 | 13.59 | 14.14 | 15.51 | 76.62 |
| | N | 280.00 | 280.00 | 280.00 | 280.00 | 280.00 | 280.00 |
| | SD | 3.29 | 4.21 | 3.77 | 4.44 | 4.08 | 15.85 |

*Source*: Compiled by authors.

The obtained results showed that self-regulation, self-motivation, and emotion recognition prevail among male financiers, other EI components are moderately expressed. The general level of EI in this group is close to high. Emotional awareness, empathy, and emotion recognition dominate among women. The general level of EI is high in this group. So, we can conclude that male financiers have more of those signs of EI that are responsible for emotional stability and orientation. The emotional side prevails in women. They are more able to recognize emotions, differentiate them, show empathy, and compassion. Their emotional intelligence is somewhat higher than that of men. In general, the group shows the highest level on the f emotion recognition, emotional awareness, empathy scales. The general indicator of EI in the group is high.

Next, we compared the decision-making indicators of financiers with different levels of EI (Table 2).

Table 2. Individual decision-making style of financiers with different levels of EI

| | | N | Mean | SD | F | Sig. |
|---|---|---|---|---|---|---|
| vigilance | low EI | 29 | 10.55 | 2.41 | 113.4 | 0.000 |
| | moderate EI | 130 | 8.96 | 2.24 | | |
| | high EI | 121 | 12.97 | 1.87 | | |
| | Total | 280 | 10.86 | 2.83 | | |
| procrastination | low EI | 29 | 4.14 | 1.09 | 34.4 | 0.000 |
| | moderate EI | 130 | 13.74 | 2.82 | | |
| | high EI | 121 | 3.52 | 1.32 | | |
| | Total | 280 | 4.61 | 2.38 | | |
| buck-passing | low EI | 29 | 9.93 | 2.09 | 32.6 | 0.000 |
| | moderate EI | 130 | 5.77 | 2.88 | | |
| | high EI | 121 | 3.59 | 1.10 | | |
| | Total | 280 | 4.64 | 2.43 | | |
| hypervigilance | low EI | 29 | 11.72 | 1.93 | 40.0 | 0.000 |
| | moderate EI | 130 | 5.86 | 2.72 | | |
| | high EI | 121 | 3.56 | 1.23 | | |
| | Total | 280 | 4.65 | 2.40 | | |

*Source:* Compiled by authors.

The obtained results indicate that there are differences in the decision-making style of financiers with different levels of EI. The medium values indicate that respondents with high EI have vigilance as a dominant style. Procrastination is pronounced in respondents with medium EI, while vigilance and hypervigilance styles prevail in subjects with low EI. Such results indicate that emotionally aware financiers make decisions faster and better. It is easier for them to interact with others and they motivate themselves to achieve the goal. Financiers with low EI, on the contrary, avoid making decisions, delay the solution of the issue, hesitate to take responsibility.

Differences in indicators of risk propensity and assertiveness of financiers with different levels of EI were also established (Table 3).

It was found that there is a statistically significant difference in indicators of risk propensity and assertiveness of financiers with different levels of EI. Subjects with a high level of EI have medium to high indicators of risk propensity and high indicators of assertiveness. Accordingly, financiers with low emotional intelligence have a low-risk propensity and low assertiveness. Risk propensity is an indicator of the ability to take risks in situations of limited awareness, when you need to make an instant decision and be sure of your actions. In such cases, EI plays a key role, as knowledge of emotions and ways of expressing them allows one to be as mobile, confident, and productive as possible. Assertiveness allows being persistent and decisive at the same time.

Table 3. Risk readiness and assertiveness of financiers with different levels of emotional intelligence

| | | N | Mean | SD | F | Value |
|---|---|---|---|---|---|---|
| risk propensity | low EI | 29 | -21.41 | 22.04 | 137.3 | 0.000 |
| | moderate EI | 130 | 7.68 | 18.65 | | |
| | high EI | 121 | 28.29 | 8.33 | | |
| | Total | 280 | 13.58 | 21.83 | | |
| assertiveness | low EI | 29 | -9.41 | 29.25 | 103.3 | 0.000 |
| | moderate EI | 130 | 18.08 | 18.77 | | |
| | high EI | 121 | 39.17 | 12.04 | | |
| | Total | 280 | 24.35 | 23.31 | | |

*Source:* Compiled by authors.

Regression analysis showed that EI affects decision-making style, risk propensity and assertiveness, which are decisive in making financial decisions (Table 4).

Table 4. Analysis of the impact of EI on the effectiveness of financial decision-making

| | β | SD | t, *p* | $R^2$ |
|---|---|---|---|---|
| vigilance | 0.943 | 0.009 | 10.30 $p≤0.01$ | 0.572 |
| procrastination | -0.040 | 0.005 | -4.6 $p≤0.01$ | 0.072 |
| buck-passing | -0.36 | 0.06 | -4.06 $p≤0.01$ | 0.056 |
| hypervigilance | -0.039 | 0.009 | -4.45 $p≤0.01$ | 0.067 |
| risk propensity | 0.896 | 0.063 | 14.29. $p≤0.01$ | 0.424 |
| assertiveness | 0.945 | 0.068 | 13.98. $p≤0.01$ | 0.483 |

*Source*: Compiled by authors.

The obtained results showed that EI explains 57% of the "vigilance" decision-making style (β=0.943, $R^2$=0.572), explains 42% of the risk propensity (β=0.896, $R^2$=0.424), and explains 48% of assertiveness ( β=0.945, $R^2$=0.483). Despite the statistical significance of other indicators, EI still explains a very small percentage of procrastination (7%), buck-passing (6%), and hypervigilance (7%). This suggests that there is a direct relationship between EI and the specified qualities. So, the higher the EI of financiers, the higher their assertiveness, risk propensity, and the "vigilance" style. All this combined provides a constructive style of decision-making, when the identified qualities complement each other and encourage effective actions.

So, it was proved that EI significantly affects the style of financial decision-making, confidence, and risk propensity in order to achieve the set goal.

## 4. Discussions

The obtained results gave grounds to establish that financiers have a high level of EI, in particular such components as emotional awareness, empathy, and emotion recognition. Emotional awareness and empathy predominate among women, while self-regulation and self-motivation dominate among men. Emotion recognition was found to be a common feature for all the subjects. EI is necessary in making financial decisions, as it depends on the ability to feel the situation and react to its changes. This means that financiers with developed EI are productive, mobile, emotionally aware, which contributes to their success. It was found that financiers with a high level of emotional intelligence have a "vigilant" decision-making style, a high level of assertiveness and risk propensity. This suggests that such employees are self-confident, determined, productive, and able to make effective decisions. Risk propensity stimulates the search for ways to achieve the success of these decisions. It was proved that EI explains half of the decision-making style, risk propensity, and assertiveness. At the same time, the "vigilance" decision-making style occupies the largest share. That is, the higher the EI of financial workers, the better their ability to make successful financial decisions.

Similar results were obtained in other studies. It was shown that EI allows effective management of finances both on a personal and professional level (Imam et al., 2022). Emotional awareness and emotional confidence lead to informed decisions. This is an indicator of the success of the activity (Irfan et al., 2023). Therefore, employees who have developed EI are more likely to achieve all financial goals and can be considered effective (Riaz and Shah, 2022). Managers with developed emotional intelligence successfully make financial decisions and maintain the financial stability of their companies (Bouzguenda, 2018). Emotional intelligence significantly affects the level of effective provision of financial services in the banking sector (Wakawa, 2020). Self-control in financiers with developed EI will lead to effective financial decisions (Fachrudin et al., 2022). Such conclusions confirm our results and testify to the important role of EI in the professional activity of financiers. A developed EI helps to successfully overcome obstacles in achieving goals, constructively build relationships, and ensure stable self-control. As a result, it is possible to achieve successful decision-making even in the conditions of insufficient resources using emotional awareness and self-regulation.

The existing relationship between EI and assertiveness proves that emotional self-control contributes to the confidence of financiers, their determination, and persistence. Such qualities have a positive effect on making financial decisions.

The researchers' approach to determining the place of risk propensity in the personality structure is ambiguous. Some researchers prove that it is an obstacle in productivity (Megías-Robles et al., 2022), while others, on the contrary, claim that a high level of risk propensity is a condition for greater achievements (Caliendo et al., 2008). We found that financiers who are willing to take risks and have high emotional intelligence are more productive. The same conclusion was reached by Bucciol et al. (2021), who found a positive correlation between EI and financial risk. The authors proved that risk with high EI promotes effectiveness in decision-making. Although they added that it is more typical for men than for women (Bucciol et al., 2021). Some research findings indicate a significant negative relationship between EI and health-related risk-taking. At the same time, such a relationship was not found in other areas of risk, in particular, finance (Sánchez-López et al., 2022).

So, we discovered that emotional intelligence is not only the ability to understand emotions, but rather the ability to successfully manage them. Especially in the field of financial decision-making. Such financiers are confident, ready to take risks at the right moment, while being prudent, emotionally stable, and vigilant in their activities. This proves that our hypothesis was confirmed.

## Conclusions and Further Research

Today, emotional intelligence is not only a psychological construct, but also an important quality of a specialist that allows controlling one's own emotional state under any circumstances. This stimulates productivity and effective decision-making. Emotional intelligence plays a key role in the financial sphere, as it forms a constructive style of activity, ensures decisiveness and confidence, and increases the willingness to take risks in situations of uncertainty. Such an influence is a significant factor in the training of competent specialists and the development of training programmes for financiers. The results are also significant for managers who can successfully model the behaviour of subordinates based on the obtained results. Emotion awareness and control can influence motivation and organizational behaviour. Therefore, taking into account such indicators in the work of financial managers will contribute to more successful financial activities.

The novelty and practical significance of the results lie in the fact that we have proven the influence of emotional intelligence on making successful financial decisions, including additional personal characteristics that allow us to work as productively as possible in the financial sphere. Taking these results into account will contribute to the optimization of the organization's financial activities as a whole, and the development of specialist training programs, including techniques for the development of emotional intelligence, will ensure the formation of a high-quality, competent staff of employees.

The limitations of the study are numerous factors that can directly or indirectly affect the emotional intelligence of financiers. This is also a gender aspect, as we have already seen. There may also be personal reasons or health problems. Therefore, such influence should be taken into account in the research in order to rule out possible influence. It is appropriate to note the breadth of the concept of "financial decision" among the limitations. It can be an ordinary decision regarding financial operations at the unit level, or it can be a decision of a more global scale. Therefore, the latter requires longer training and specialist competence, and time in some cases.

The research prospects are the study of additional aspects of influence on financial decision-making, such as self-efficacy, coping strategies, reflexivity, stress resistance, etc. It is also necessary to investigate such aspects of the emotional intelligence of financiers as age and work experience, which may limit emotional intelligence.

## Credit Authorship Contribution Statement

The authors equally contributed to the present research, at all stages from the formulation of the problem to the final findings and solution.

## Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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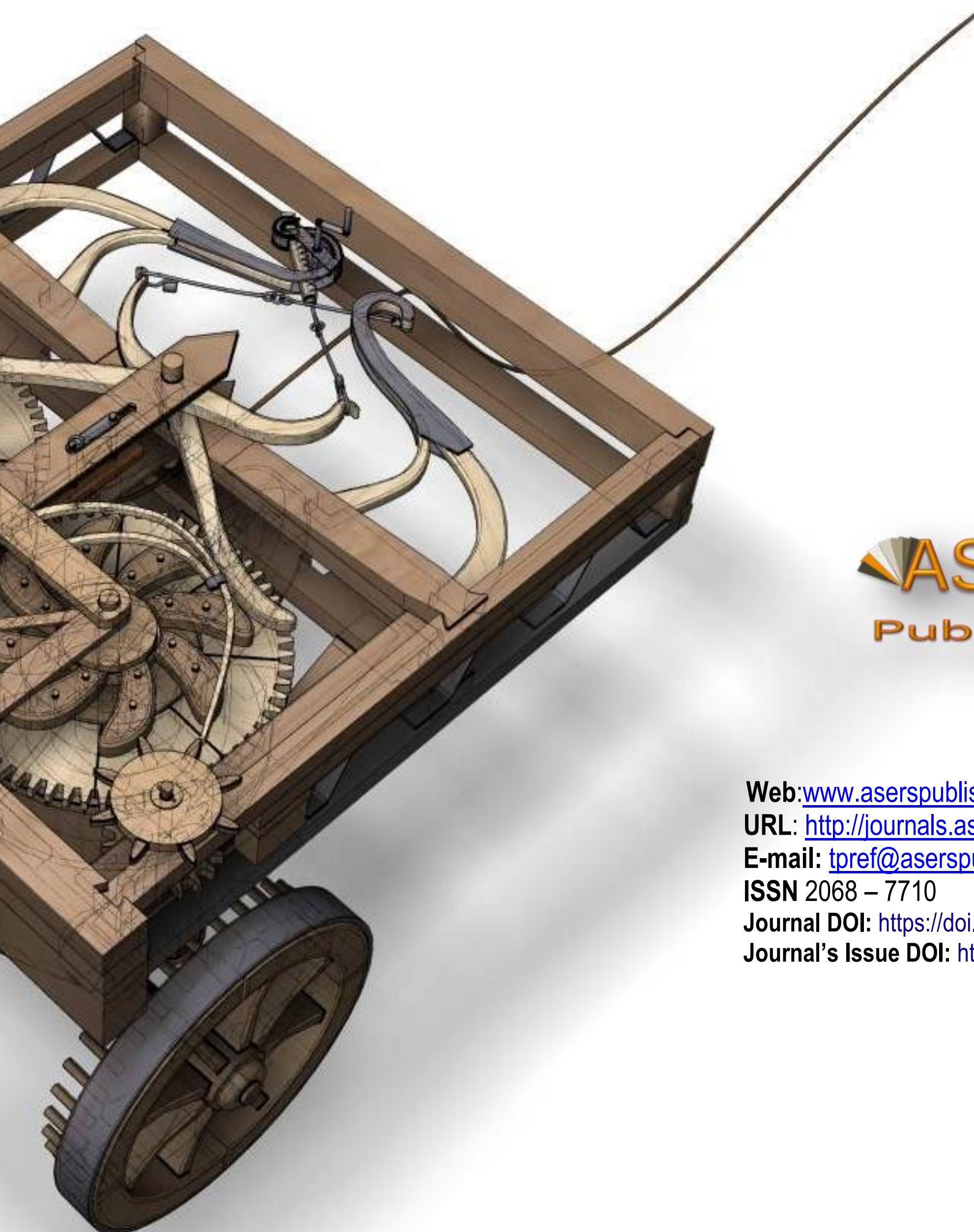

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