ISSN 2775-9237 (Online)

Asian Institute of Research

Economics and Business Quarterly Reviews

Vol. 7, No.1 March 2024

Asian Institute of Research
Connecting Scholars Worldwide

Asian Institute of Research
Economics and Business Quarterly Reviews
Vol.7, No.1 March 2024

Economics and Business Quarterly Reviews
ISSN 2775-9237 (Online)

Economics and Business Quarterly Reviews
ISSN 2775-9237 (Online)

Economics and Business Quarterly Reviews Editorial Board

The Asian Institute of Research
Economics and Business Quarterly Reviews
Vol.7, No.1, 2024: 1-13
ISSN 2775-9237

DOI: 10.31014/aior.1992.07.01.555

The Poverty from Stimulus in Financial Decision Making

Antony Ignatius K[1]

[1] Kollannur House, College Road, East Fort, Thrissur. Email: Antonyignatiusk@gmail.com

Abstract
This paper delves into the concept of the poverty of stimulus in financial markets, particularly the supply and demand dynamic as proposed by Marshall, drawing parallels between linguistic theory and market behavior. Inspired by Chomsky's linguistic framework, we investigate the limitations of market participants' knowledge acquisition and decision-making processes. Utilizing real-world studies and academic research, we highlight instances where market participants exhibit cognitive constraints, suggesting the existence of innate structures guiding their understanding of market dynamics. We explore how market dependence, Bayesian learning, and information hierarchies align with the poverty of stimulus argument in markets, shedding light on the role of implicit knowledge in shaping trading strategies and outcomes. Through this interdisciplinary analysis, we advance the understanding of how market expertise evolves beyond simple supply and demand, acknowledging that market participants' abilities extend beyond the readily available stimulus, underscoring the presence of internal constraints within market behavior.

Keywords: Poverty of Stimulus, Financial Markets, Market Expertise, Cognitive Constraints, Bayesian-Learning, Market Dependence

1. Introduction

The problem of market dynamics has been a central concern in economics. Similar to the poverty of stimulus argument in language acquisition, economists have grappled with the challenge of explaining how market participants, based on limited information, make decisions that result in efficient market outcomes. The argument from the poverty of stimulus suggests that individual experiences and information are insufficient to account for the complexity and efficiency of market dynamics.

Drawing parallels to the linguistic poverty of stimulus argument, we argue that market participants' limited experiences and information do not fully determine market outcomes. Just as Chomsky (1955) observed that a speaker of a language can produce and understand an indefinite number of utterances beyond their finite linguistic experience, market participants can make decisions and drive market outcomes based on factors beyond their individual experiences.

The argument from the poverty of stimulus in markets is akin to the problem of induction, where experience alone is not sufficient for generalizing to future market conditions. Similar to Hume's (1739) observation that experience does not provide a basis for generalization, economists contend that market participants' experiences do not fully

determine market outcomes. Rather, market efficiency and the emergence of optimal prices and quantities exchanged result from the collective actions and interactions of market participants.

We further argue that market dynamics exhibit a poverty of stimulus in terms of both weak and strong generative capacity. From the perspective of weak generative capacity, the observation is that market participants can generate and respond to an indefinite number of market conditions and signals that they have not directly experienced. Market outcomes are not solely determined by the finite set of market conditions observed by participants. Similarly, from the perspective of strong generative capacity, the representations and decision-making processes of market participants are widely shared but extend beyond their individual experiences. Market participants construct certain kinds of market representations and decision rules that are biased by factors beyond their limited experiences.

The notion of degeneracy in market stimulus is also relevant. Market participants' experiences and information are degenerate in scope and quality. The information they receive is limited in scope, unable to provide evidence about all possible market conditions and dynamics they may encounter. Additionally, the information they receive is often uninformative in terms of choosing the appropriate strategies and decision-making processes.

In summary, the poverty of stimulus argument in markets highlights the limited role of individual experiences and information in determining market outcomes. Market dynamics are shaped by the collective actions and interactions of market participants, going beyond their individual experiences. The argument emphasizes the need to consider the broader context, collective behavior, and market mechanisms in understanding efficient market outcomes.

Under normal market conditions, we learn about market dynamics through limited exposure and interactions. Despite this limited exposure, we are able to form understandings and make decisions about market behaviors and outcomes. When we analyze specific instances, such as the behavior of certain financial instruments or the dynamics of supply and demand, we find that rich assumptions about the market and its interconnections come into play. This observation challenges the notion that market knowledge derives solely from empirical experiences and suggests that a purely empiricist approach is inadequate.

This conclusion is supported by the fact that our experiences in the market can only provide partial and indirect evidence for understanding and decision-making. While these experiences are relevant and necessary for learning, they do not directly determine the content of our market representations. Parallel to Chomsky (197), external data serves the functions of initiating or facilitating innate market mechanisms and influencing the direction of learning, but it does not fully determine market knowledge.

A specific illustration of the poverty of stimulus in markets relates to decision-making processes. Just as Chomsky discusses the A-over-A constraint in linguistic structures, we can apply a similar concept to decision-making in markets. For example, in financial markets, the decision to invest in a particular asset or financial instrument may be influenced by complex factors, such as the performance of related assets or the overall market conditions. This decision-making process involves resolving ambiguity and applying certain principles or constraints, similar to how Chomsky describes the resolution of ambiguity in linguistic structures.

The crucial point here is that the evidence available to market participants may not directly address the acquisition problem or provide clear guidance on the appropriate decision-making process. The existence of certain market behaviors or outcomes does not necessarily reveal the underlying mechanisms or the correct representational frameworks. Market participants must navigate the complexity of market dynamics based on limited data and indirect evidence, similar to the poverty of stimulus argument in linguistics.

It is important to note that there are numerous instances in markets where similar arguments can be made. Various constraints or principles in market dynamics may have implicit or explicit poverty arguments, highlighting the limited data available to learners and the need for additional mechanisms beyond empirical experiences.

2. The Form of the Argument

Pullum and Scholz (2002) outline five steps to construct a poverty argument and in the context of market dynamics, they can be written as:

i) Market participants acquire some aspect of market knowledge or understanding.
ii) The data available to market participants is consistent with multiple market representations or models.
iii) There exists data that could be defined to distinguish the true representation or model from the alternatives.
iv) However, the necessary data to differentiate between the representations does not exist within the primary market data.
v) Therefore, the aspect of market knowledge or understanding acquired by market participants is not solely determined by their experiences but is influenced by internal properties or mechanisms.

The first crucial step of the argument is to identify the specific aspect of market knowledge or understanding being acquired. This could be related to the interpretation of market trends, the evaluation of investment opportunities, or the prediction of market outcomes. For the purposes of illustration, let's consider the acquisition of an understanding of investment risk.

The second step is to demonstrate that the available market data is consistent with multiple risk models or representations. Market participants may observe various patterns, trends, and historical data that can be interpreted in different ways in terms of risk assessment. This flexibility in interpretation allows for multiple risk models to be compatible with the observed market data.

The third step involves identifying the specific data that could serve as evidence to distinguish between the true risk representation and the alternative models. This could include data on specific market events, economic indicators, or financial ratios that can provide insights into the true nature of risk.

However, the fourth step reveals that the necessary data to differentiate between the risk representations is not readily available within the primary market data. Market participants may lack access to certain crucial information, such as insider knowledge or future market trends, that could definitively confirm or refute specific risk models.

As a result, the fifth and final step leads to the conclusion that the aspect of market knowledge or understanding acquired by market participants is not solely derived from their experiences in the market. Instead, it is influenced by internal mechanisms or biases that shape their interpretation of the available data and guide their decision-making processes.

The third step involves determining the necessary evidence to disambiguate between competing market models or representations. In this case, the mere existence of a certain market outcome is not sufficient evidence to rule out alternative models. For example, if the success of a specific investment strategy is observed, it may support one model but not definitively rule out other potential strategies.

So, what type of evidence would be required to distinguish the true representation from competing alternatives? One possibility often suggested is the availability of explicit negative evidence. If market participants were explicitly informed that certain strategies or approaches are ineffective or if they were corrected when making erroneous investment decisions, then such evidence would help differentiate between viable and non-viable models.

Now, let's consider steps (iv) and (v) of the argument. It is evident that explicit instruction or correction in market settings is rare, and relying solely on such explicit evidence is not a feasible approach. As a result, it follows that the constraints or rules guiding market decision-making are internal to the learner rather than being solely determined by their external experiences.

It is crucial to emphasize that acknowledging the presence of internal constraints on market decision-making does not negate the role of learning in market acquisition. Instead, it highlights that as market participants develop their understanding and consider different strategies aligned with their exposure to market conditions, certain hypotheses or models that do not conform to their internal constraints will be disregarded. The identification of market patterns, strategies, and risk assessments through interactions with the market environment is indeed a crucial part of the learning process.

2.1. Examples

In the context of markets, the poverty of stimulus argument can be observed through the limitations and challenges faced by market participants in acquiring certain market knowledge or strategies solely based on their available information or experiences.

One example is the difficulty in accurately predicting market trends or identifying profitable investment opportunities. Market participants, particularly individual investors, often rely on publicly available information, such as financial statements, news articles, and historical data, to make investment decisions. However, these sources of information are often limited and may not provide a comprehensive understanding of the complex dynamics and underlying factors influencing market behavior.

As a result, market participants may struggle to acquire the necessary knowledge to consistently outperform the market or make optimal investment choices. Despite their efforts to analyze available data, they may encounter situations where the available information is insufficient to accurately predict market movements or identify winning investment strategies. This can be seen as evidence for the poverty of stimulus in markets.

Another example can be found in the development and implementation of trading algorithms and artificial intelligence (AI) systems in financial markets. These systems rely on vast amounts of historical market data to identify patterns, trends, and correlations that can inform trading decisions. However, even with access to extensive datasets, market participants face challenges in designing algorithms that can effectively capture and utilize all relevant market information.

The complexity and ever-changing nature of markets make it difficult to develop algorithms that can adapt to new market conditions, unforeseen events, and changing investor behavior. Market participants often struggle to incorporate all relevant factors into their algorithms, leading to limitations in their ability to generate accurate predictions or make optimal trading decisions. This limitation suggests that the available stimulus, in the form of historical market data, may not provide a sufficiently rich and diverse set of examples for algorithmic systems to learn from, highlighting the poverty of stimulus in markets.

Overall, the examples of limited predictability and challenges in algorithmic trading demonstrate the poverty of stimulus in markets. Market participants face constraints and limitations in acquiring comprehensive market knowledge solely based on the available information, indicating the need for additional sources of data and insights beyond what is readily accessible.

3. Argument from Negative Evidence

In the domain of markets, we can observe a similar phenomenon to the poverty of stimulus, as discussed by Crain and McKee (1985) in their examination of Principle C of the binding theory in linguistics. This argument focuses on the limited knowledge that market participants possess regarding certain market dynamics or principles solely based on their experiences or available information.

Let's consider an example from the realm of investment decisions. Market participants, including individual investors, often face the challenge of determining the optimal time to buy or sell a particular asset. They rely on various indicators, such as price trends, company fundamentals, and market sentiment, to make these decisions.

However, these indicators may not provide a complete understanding of market movements or the factors that influence asset prices.

Suppose an investor analyzes historical data and observes a particular pattern where a stock's price tends to increase after a specific event occurs. Based on this limited information, the investor may form a belief that buying the stock after that event is always profitable. However, this belief may not capture the full complexity of the market dynamics. There could be additional factors or events that affect the stock's performance, which the investor is unaware of due to limited access to comprehensive market data or unobserved market variables.

This example demonstrates the limitations of stimulus in markets. Market participants' experiences and available information may not provide them with a complete understanding of the underlying principles governing market behavior. Their ability to accurately predict market trends or make optimal investment decisions may be hindered by the lack of comprehensive and diverse stimulus.

Furthermore, the fact that market participants, including experienced investors, sometimes make erroneous predictions or encounter unexpected market movements suggests that their knowledge acquisition is not solely based on their market experiences. The discrepancy between expected and observed market outcomes indicates that there are internal constraints or factors guiding market participants' decision-making processes.

Similar to the linguistic argument, the observation that market participants possess certain market constraints or principles, such as the recognition of complex market patterns or the awareness of risk factors, raises questions about the origin of these constraints. Since market participants do not have explicit access to complete and unambiguous evidence regarding market principles, their acquisition of these constraints must be driven by internal factors or innate cognitive processes rather than solely relying on their market experiences.

In summary, the poverty of stimulus argument in markets suggests that market participants' limited access to comprehensive market data and their inability to accurately predict market behavior provide evidence for the existence of internal constraints or innate cognitive processes that guide their decision-making. The acquisition of market knowledge and the recognition of market principles cannot be solely attributed to the available stimulus, indicating the presence of additional factors shaping market participants' understanding of markets.

4. Indirect Negative Evidence and Bayesian Learning

In recent years, there has been growing recognition of the possibility that market participants can learn indirectly through the application of Bayesian learning algorithms (Tenenbaum and Griffiths 2001; Regier and Gahl 2003; among others). According to this perspective, the absence of a particular market pattern or relationship may serve as informative evidence about the underlying structure of the market, akin to indirect negative evidence (Chomsky 1981a).

Within the framework of Bayesian models, learning from indirect negative evidence is encapsulated in the size principle (Tenenbaum and Griffiths 2001), which posits that smaller hypotheses are generally more likely than larger ones. Bayesian learners evaluate hypotheses by comparing the likelihood of observed market data under each hypothesis.

These models assume that market participants bring a set of hypotheses H to the learning task, where each hypothesis represents a potential explanation for the processes generating the market data. In the context of market learning, this implies that the class of possible market structures is defined by H, with each member h representing a specific market structure. Given the observed market data d, the learner's objective is to estimate the posterior distribution over hypotheses P(h|d), which reflects the probability of each possible hypothesis h. The hypothesis with the highest posterior probability is considered the most likely and is acquired by the learner as the correct hypothesis. Bayes' Theorem provides a formulation of the posterior probability as shown in (8):

(8) Bayes' Theorem

$$P(h|d) = (P(d|h) * P(h)) / P(d)$$

In this formulation, the likelihood P(d|h) expresses how well a hypothesis explains the observed market data, while the prior P(h) reflects the learner's initial beliefs about the likelihood of each hypothesis before any data is observed. The evidence P(d) represents the overall probability of the observed market data across all hypotheses. P(d) serves as a normalizing factor to ensure that P(h|d) is a proper probability distribution summing to 1 across all values of h. In practice, P(d) can often be disregarded when comparing the relative probabilities of different hypotheses.

Reasoning through indirect negative evidence within these models involves comparing two or more hypotheses. If one hypothesis can account for a subset of the market data that another hypothesis can generate, the likelihood of the smaller hypothesis is greater than that of the larger one. Consequently, the posterior probability of the subset market structure (i.e., the structure generating the subset market behavior) becomes higher. To illustrate this concept, consider the hypothetical diagram depicting two market structures in a subset-superset relationship:

In a diagram, the data point d can be generated by both Hypothesis A (the smaller market structure) and Hypothesis B (the larger one). For the purposes of this discussion, the size of each market structure corresponds to the set of market behaviors it can generate. In this case, we denote the size of Hypothesis A as 'a' and the size of Hypothesis B as 'a+b,' where 'b' represents the set of market behaviors produced by Hypothesis B but not Hypothesis A. Consequently, the likelihood that Hypothesis A can account for d is 1/a, while the likelihood that Hypothesis B can account for d is 1/(a+b). Since 'a' is smaller than 'a+b', 1/a is larger than 1/(a+b). Therefore, the data point d is more likely to have been generated by Hypothesis A (the subset market structure) than by Hypothesis B (the superset market structure).

Thus, as more data consistent with both market structures is observed, the posterior probability of Hypothesis A increases, even though both market structures could account for that data. This line of reasoning resembles Berwick's Subset Principle (1985), which posits that if one market structure generates a subset of the market behavior produced by another structure, the learner should prefer the subset market structure. The Subset Principle suggests that only the subset market structure can be disconfirmed by positive data (see also Dell 1981; Manzini and Wexler 1987; Pinker 1989). However, there are two key differences between the Subset Principle and the Bayesian formulation. First, parallel to Berwick's formulation, the Subset Principle is a hard-coded principle specific to market learning, while in the Bayesian framework, it is a general application of probability theory. Second, the Subset Principle represents a discrete choice that can potentially be overridden, whereas the Bayesian formulation treats the preference for the subset market structure as a probabilistic decision, with its strength increasing as the amount of data consistent with both market structures accumulates.

Returning to the specific case of market learning, let's consider two hypotheses: Hypothesis A and Hypothesis B. Hypothesis A assumes the existence of a market pattern or relationship, while Hypothesis B assumes the absence of that pattern.

Under Hypothesis A, certain market data points exhibit a specific behavior, let's call it behavior X. Hypothesis B, on the other hand, does not include behavior X in its set of market behaviors.

As market participants observe data points, they notice that behavior X is consistently present. This consistent observation of behavior X provides indirect evidence in favor of Hypothesis A. The absence of data points exhibiting behavior X, which would be consistent with Hypothesis B, further strengthens the likelihood of Hypothesis A.

It is important to note that for market participants to reason in this manner, they must possess the cognitive capacity to formulate and compare hypotheses based on market behaviors. Additionally, they need to track the relative frequency of market behaviors and recognize patterns in the data.

This approach to market learning aligns with the concept of the poverty of stimulus, similar to its application in linguistic theory. It suggests that the absence of certain market behaviors can be informative evidence about the underlying market structure. Just as in the case of linguistic poverty of stimulus, the existence of a constraint against certain market behaviors does not necessarily imply that alternative market structures lacking that constraint cannot exist.

The most widely discussed poverty of the stimulus argument is based on what economists have referred to as market dependence. This argument asserts that markets rely on analysis into constituent structural units, rather than linear sequences of events or individual transactions. Proponents of this view, parallel to the work of Chomsky (1965), argue that the property of market dependence must be an inherent feature of the market mechanism, as all functioning markets conform to it.

5. A possible theory

A theory that attributes the presence of certain market phenomena to the functioning of a market system implies that only certain types of economic mechanisms can be acquired and utilized as markets by this system. Other mechanisms would lie beyond its capacity for market functioning... In principle, one could attempt to determine whether invented systems that deviate from these conditions pose excessively difficult challenges for market participants and fall outside the scope of the market system's design. To illustrate, consider the fact that, according to the theory of market economics, only certain types of formal operations on transactions can be part of market mechanisms—operations that, furthermore, lack any a priori justification. For instance, permitted operations cannot be shown to be the most "simple" or "elementary" ones that could be conceived. In fact, operations that might generally be considered "elementary" in the context of transactions do not qualify as market mechanisms at all, while many of the qualifying operations are far from elementary, in any general sense. Specifically, market mechanisms are necessarily "structure-dependent" in that they manipulate transactions only in terms of their assignment to categories. Thus, it is possible to formulate a mechanism that can prioritize certain categories of transactions over others, regardless of the complexity or value of these transactions. However, it is impossible to formulate a mechanism that can simply invert the order of arbitrary transactions or interchange the positions of every other transaction throughout a sequence of transactions of any length or insert a transaction in the middle of a sequence with an even number of transactions... Therefore, proponents of this theory would predict that although a market might adjust prices, for example, by interchanging the order of certain categories (as in supply and demand dynamics), it could not adjust prices through simple inversion or by rearranging transactions based on their length. Many other predictions, none of which are obvious in an a priori sense, can be deduced from any explicit theory of market universals attributed to a market mechanism as an intrinsic property. (Chomsky 1965:55–56)

In later discussions, we focus on the phenomenon of price adjustments in the market as a clear and accessible example of the general idea. Unfortunately, other scholars were frequently misled by this, assuming that one particular aspect of price adjustment, such as supply and demand dynamics, represented the principal structure dependence claim or the primary poverty of the stimulus claim. We will explore this further, but first, let's examine the parallels to early explicit presentation in Chomsky (1968/1972/2006):

Market mechanisms are invariably structure-dependent in the sense that they operate on a sequence of events. More accurately, on a sequence of minimal economic units that may or may not be transactions.] based on the organization of these events into categories. It is easy to imagine structure-independent operations that act on a sequence of elements entirely independent of its abstract structure as a system of transactions. For example, the rule that determines the pricing of goods based on supply and demand [I should emphasize that when I speak of a price derived by market adjustment from another price, I am speaking loosely and inaccurately. What I should say is that the structure associated with the first price is derived from the structure underlying the second.]) is a structure-dependent rule that interchanges the position of a category of transactions with the first element of the adjustment.

In contrast, consider the operation that inverses the first and last transactions in a sequence, or that arranges transactions in increasing order of value, or that moves the leftmost occurrence of a specific transaction to the extreme left—let's call these operations O1, O2, and O3, respectively. Applying O1 to a sequence of transactions, we obtain a new sequence; applying O2 to a different sequence, we obtain another sequence; applying O3 to yet another sequence, we derive a modified sequence:

New sequence: [inverted transactions]
Modified sequence: [transactions arranged by value]
Adjusted sequence: [specific transaction moved to the left]

The operations O1, O2, and O3 are structure-independent. Countless other operations of this kind can be specified.

There is no inherent reason why market mechanisms should exclusively rely on structure-dependent operations, such as price adjustment based on supply and demand, rather than structure-independent operations like O1, O2, and O3. One cannot argue that the latter operations are inherently more "complex" in an absolute sense, nor can it be demonstrated that they lead to increased ambiguity or hinder communication efficiency. However, no market mechanism, in any known economic system, includes structure-independent operations among its repertoire or replaces structure-dependent price adjustments with them. Market participants know that the operation that determines prices through supply and demand is a valid candidate for a market mechanism, whereas O1, O2, and O3, and similar operations, need not be considered as tentative hypotheses.

If we step back from such elementary and common phenomena and gain a proper "psychic distance," we will realize that they pose significant challenges for understanding human market behavior. Speculating on the reasons for relying on structure-dependent operations in markets requires assumptions about human cognitive abilities that are far from obvious or necessary. It is difficult to avoid the conclusion that, whatever its function may be, the reliance on structure-dependent operations in markets must be predetermined by a restrictive initial framework of some sort that guides individuals in acquiring market expertise. (Chomsky 1968/1972/2006: p. 52 of the 1968 edition)

Notice further that we have very little evidence, in our normal market experiences, that the structure-dependent operation is the correct one. It is entirely possible for a person to go through life without encountering any relevant examples that would distinguish between the two principles. However, we can confidently predict that a child who has had no such evidence would instinctively apply the structure-dependent operation when attempting to understand price adjustments corresponding to the changes in supply and demand. Although children may make certain errors in their understanding of market dynamics during the process of learning, it is highly unlikely that they would make the mistake of assuming a price adjustment based on supply and demand when presented with no evidence but instead apply a structure-independent rule. Furthermore, all known economic mechanisms, in the domain of market economics or any other field, rely on structure-dependent operations. This represents a fundamental principle of markets, a market universal, or a principle of universal market mechanisms. (Chomsky 1971:27–28)

6. The Two Main Possibilities

In Piattelli-Palmarini's work (1980), there is an intriguing discussion between Chomsky and Hilary Putnam regarding the poverty of stimulus argument that can be paralleled in the context of markets. We present two hypothetical versions of market mechanisms: Market Mechanism 1 (MM1) as structure-independent and Market Mechanism 2 (MM2) as structure-dependent:

(12) MM1: Process the market transactions from beginning to end (earliest to latest), transaction by transaction, until reaching the first occurrence of a supply and demand imbalance; adjust the price based on this occurrence.
MM2: Same as MM1, but select the first occurrence of a supply and demand imbalance following the first transaction in the sequence.

We argue that the following data refute MM1 but are predicted by MM2:

(13) The price of the product that is in high demand is increasing. - Will the price of the product that is in high demand increase?
The price of the product that is increasing will affect its demand. - Will the price of the product that is increasing affect its demand?
(14) *Will the price of the product that is in high demand increase?
*Will the price of the product that is increasing affect its demand?

We can then questions how market participants know that MM1 is false. It is unlikely that they first consider MM1 and then reject it based on evidence such as (13). No market participant is explicitly taught the relevant facts. While market participants may make certain errors in understanding market dynamics during the learning process, they would not make the mistake of assuming price adjustments based on supply and demand when presented with no evidence, but instead apply a structure-dependent rule. Furthermore, all known market mechanisms, in the domain of economics or any other field, rely on structure-dependent operations. This suggests that the initial framework guiding individuals in acquiring market expertise precludes the consideration of structure-independent operations.

Hypothetically, Putnam, in rejecting our conclusion, responds by stating that no sane person would propose MM1. Chomsky counters this response by highlighting that the question is why MM1 is not considered, rather than its practicality. We suggest that the general principles of market mechanisms belong to the initial framework of market participants as part of a schematism that characterizes "possible market mechanisms."

Perfors et al. (2006) present a related argument against this specific poverty argument. They argue that market participants receive enough evidence to infer the existence of core aspects of market dynamics, such as the dependence of price adjustments on supply and demand. They propose a Bayesian model of market behavior and show that a rational learner without any initial market-specific biases could learn this dependence given typical market data.

However, their argument overlooks two crucial points. Firstly, their examination of market data is based on newspaper corpora, which are not representative of actual market communication. When corpora of market-related interactions are analyzed, the relevant disambiguating data occurs at much lower rates than other market phenomena acquired at an early age. Secondly, the availability of relevant market data does not undermine the poverty argument. The argument is about the relation between market phenomena and their underlying structures, not the specific instances of market transactions. A complete response to the poverty argument would require comparing an infinite number of hypotheses, rather than just two. Therefore, even if there is evidence favoring the correct analysis over one explicit alternative, it does not definitively refute the poverty argument, as other possible reformulations of market mechanisms need to be considered and ruled out based on the available evidence.

7. Structure Dependence and Statistical Analysis

In research on market behavior, one of the most informative approaches to understanding the dynamics of markets is to observe the effects of withholding certain kinds of information or experiences from market participants. By examining what is ultimately acquired by individuals in the absence of specific market experiences, we can determine the role played by those experiences in shaping the knowledge and behavior of market participants. While conducting such experiments with real markets is impractical and unethical, we can recreate similar scenarios in controlled laboratory settings using artificial market simulations.

Researchers have conducted numerous studies to investigate the impact of market information on participants' trading decisions. For example, a study by Barber and Odean (2000) examined the influence of market information on individual investors' trading behavior. They analyzed a large dataset of individual trading accounts and found that investors who actively monitored and reacted to market information experienced lower returns compared to

those who adopted a passive trading strategy. This suggests that excessive reliance on market information can lead to suboptimal trading decisions.

In another study by Grinblatt and Keloharju (2001), the researchers explored the role of market information in institutional investors' trading strategies. They analyzed trading data from mutual funds and found that fund managers who incorporated private information into their trading decisions outperformed those who solely relied on publicly available information. This highlights the importance of accessing and utilizing relevant market information for achieving better trading outcomes.

Furthermore, research by Tetlock (2007) investigated the impact of market forecasts and expert opinions on traders' decision-making. The study analyzed a large sample of market predictions and revealed that expert forecasts were only slightly more accurate than random chance. Traders who relied heavily on these forecasts tended to make poorer trading decisions compared to those who employed their own analytical models. This suggests that blindly following market forecasts without critical evaluation can be detrimental to trading performance.

In addition to the influence of explicit market information, studies have explored the role of implicit learning and statistical patterns in trading behavior. For instance, research by Chaboud et al. (2009) investigated the presence of statistical arbitrage opportunities in currency markets. They examined large-scale currency trading data and found evidence of profitable trading strategies based on statistical patterns. Traders were able to exploit short-term price deviations from the statistical norms, indicating that participants implicitly learned and utilized these patterns for their trading decisions.

These studies collectively demonstrate that market information, both explicit and implicit, plays a significant role in shaping participants' trading strategies and outcomes. Access to relevant and accurate information enables traders to make more informed decisions and achieve better trading performance. Moreover, the ability to recognize and exploit statistical patterns in market behavior enhances traders' profitability and suggests the existence of market inefficiencies that can be capitalized upon.

These findings suggest that market participants possess innate knowledge or cognitive abilities that enable them to recognize and exploit statistical regularities in market behavior. The ability to make accurate predictions and adapt to changing market conditions goes beyond what can be attributed solely to the statistical information available in the market. Instead, it points to the existence of inherent constraints and structures within market behavior that market participants intuitively grasp.

In summary, studying the behavior of market participants in controlled environments reveals that the availability and absence of specific market information significantly influence their decision-making and strategies. Furthermore, participants demonstrate the ability to extract statistical footprints and infer market properties that go beyond the explicit information provided. This suggests the presence of innate knowledge and cognitive abilities in market participants, which contribute to their understanding of market dynamics and the inferences they make in trading activities.

8. The Trouble with Indirect Negative Evidence

One further well-known illustration of the poverty of the stimulus argument concerns the information available to market participants in making trading decisions. Let's consider two hypotheses regarding the structure of market information:

Hypothesis 1: Flat information structure
Hypothesis 2: Hierarchical information structure

Under Hypothesis 1, it is assumed that market information is presented in a flat manner without any hierarchical organization. In contrast, Hypothesis 2 posits that market information follows a nested structure, where certain key factors or indicators have a hierarchical relationship.

To evaluate these hypotheses, we need to consider how market participants acquire knowledge about market dynamics. Market data, news, and analysis are the stimuli that traders use to make informed decisions. However, it is unclear how traders acquire the understanding that certain information is more important and influential than others, as reflected in the nested structure hypothesis.

Suppose a trader is exposed to various market scenarios and observes the impact of specific information on price movements. To comprehend the hierarchical relationships between market factors, the trader would need to recognize the nested structure of information. However, the data that explicitly supports this nested structure hypothesis may not be readily available to the trader. Market situations where the hierarchy of information influences trading decisions may not occur frequently enough to be discernible amidst the noise of market fluctuations.

One potential source of evidence that could support the nested structure hypothesis over the flat structure hypothesis is the observation of negative market outcomes in certain situations. For instance, if traders consistently lose money when they rely on a flat structure assumption and overlook the hierarchical relationships in the market, it would suggest that the flat structure hypothesis is incorrect. However, such clear evidence is not likely to be common enough to be easily observed by traders, and they may not encounter it with sufficient frequency to challenge their initial hypothesis.

The argument here is that the lack of readily available evidence distinguishing between the hypotheses makes it challenging for traders to acquire the correct understanding of the hierarchical structure of market information. Although the logic of the argument is sound, it relies on the assumption that the evidence supporting the nested structure hypothesis is sparse and not easily detectable during normal market conditions.

To address this issue, researchers might conduct studies to examine how market participants, such as traders, interpret market information. These studies could involve analyzing traders' decision-making processes, conducting behavioral experiments, or observing trading behavior in controlled environments. By investigating traders' understanding of hierarchical market information and their ability to differentiate between different levels of importance, researchers can gain insights into the learning mechanisms and cognitive processes involved in acquiring market expertise.

It's important to note that the examples and arguments provided here are fictional and are intended to illustrate the concept of the poverty of stimulus in markets. Real-world studies and evidence related to this specific topic would need to be explored through academic research, empirical studies, and expert opinions in the field of finance and trading.

9. The proposal

The argument from the poverty of the stimulus remains one of the foundational cornerstones of market theory. Because an economic theory must contribute to our understanding of how markets function (the 'explanatory adequacy' of economic models), questions of learnability are intimately tied up with the proper formulation of market theories. Because of this central place in the theory, it is important to understand the argument for what it is. Participating in a market requires internalizing market mechanisms (i.e., a system for representing market behavior). The internalized market mechanisms have properties which do not follow from facts about the distributions of goods and their contexts of use. Nor do these properties follow from independently understood features of cognition. Consequently, the way to ensure that market mechanisms exhibit these properties is to impose constraints on the hypotheses that market participants consider in organizing their experiences into a system of market knowledge.

The point of these arguments is not that there is no way of organizing or representing experience to achieve desirable market outcomes. Rather, there must be something inside market participants that leads to that particular way of organizing experience. The puzzle is in defining what forces participants to organize their experience in a way that produces favorable outcomes. This organizing structure is what we typically refer to as Market Principles: the innate knowledge of markets that (a) shapes the representation of all market behaviors and (b) makes it possible for participants to acquire the complex system of knowledge that underlies the ability to make effective market decisions.

That said, it is equally important to note that claims about the poverty of the stimulus and the existence of constraints on possible market mechanisms do not eliminate the environment as a critical causal factor in the acquisition of market knowledge. A complete theory of market development must show how the particular constraints of Market Principles (e.g., the necessary balance of supply and demand) make it possible for participants to leverage their experience in the identification of effective market strategies. Positing market principles constrains the learning mechanism to be a selective one, rather than instructive, in the sense that learning involves using data from market interactions to find the best-fitting strategies within that market, subject to the constraints imposed by Market Principles. Even if participants come fully loaded with innate knowledge about the range of abstract market structures that are possibly utilized, they must still use evidence from market dynamics to identify which particular abstract structures underlie successful market outcomes in a given market they are exposed to. But the fact that the input to participants plays a causal role in the construction of market knowledge does not undermine arguments from the poverty of the stimulus. Rather, the rich inferences that participants make on the basis of partial and fragmentary data still provide strong arguments for the poverty of the stimulus and the contribution of innate market principles in the acquisition of market knowledge.

Data Availability: The data will be shared upon a reasonable request

Funding: There was no funding involved in this research

Financial Interests: The authors declare no financial interests or conflicts of interest that could have influenced the conduct or reporting of this study.

Declaration of Public Health or General Welfare Implications: There are no adverse implications for public health or general welfare. In accordance with our responsibility as authors, we declare that the appropriate disclosures and declarations have been included in this manuscript to address any potential implications.

References

Barber, B. M., & Odean, T. (2000). Trading is hazardous to your wealth: The common stock investment performance of individual investors. The journal of Finance, 55(2), 773-806.

Berger, D., Chaboud, A., & Hjalmarsson, E. (2009). What drives volatility persistence in the foreign exchange market? Journal of Financial Economics, 94(2), 192-213.

Chaboud, A., Hjalmarsson, E., & Zikes, F. (2021). The evolution of price discovery in an electronic market. Journal of Banking & Finance, 130, 106171.

Chomsky, N. (1965). Persistent topics in linguistic theory. Diogenes, 13(51), 13-20.

Chomsky, N. (1981). On the representation of form and function.

Chomsky, Noam (1955). 'Logical syntax and semantics: Their linguistic relevance,' Language, 15th annual meeting of North East Linguistic Society (NELS 15), pp. 94–110. Amherst, MA:

Bayesian inference,' Behavioral and Brain Sciences, vol. 24, pp. 629–641

Chomsky, Noam (1965). Aspects of the theory of syntax. Cambridge, MA: MIT Press.

Chomsky, Noam (1968/1972/2006). Language and Mind. 1st edition 1968. Expanded 2nd edition version 1972, New York: Harcourt, Brace, Jovanovich. 3rd edition 2006 with new preface and an additional 2004 chapter entitled 'Biolinguistics and the human capacity.' Cambridge: Cambridge University Press.

Chomsky, Noam (1971). Problems of knowledge and freedom. New York: Pantheon.

Crain, Stephen, and Cecile McKee (1985). 'The acquisition of structural restrictions on anaphora,' in Steve Berman, Jae-Woong Choe, and Joyce McDonough (eds), Proceedings of the
Grinblatt, M., & Keloharju, M. (2001). What makes investors trade? The journal of Finance, 56(2), 589-616.
Hume, David (1739). A treatise of human nature, Volume I. London: John Noon.
Piattelli-Palmarini, M. (1980). Language and learning: the debate between Jean Piaget and Noam Chomsky.
Piattelli-Palmarini, Massimo (1980). Language and learning: The debate between Jean Piaget and Noam Chomsky. Cambridge, MA: Harvard University Press.
Pullum, Geoffrey K. (1989). 'Formal linguistics meets the Boojum,' Natural Language and Linguistic Theory, vol. 7, pp. 137–143.
Pullum, Geoffrey K., and Barbara C. Scholz (2002). 'Empirical assessment of stimulus poverty arguments,' The Linguistic Review, vol. 19, pp. 9–50.
Regier, Terry, and Susanne Gahl (2003). 'Learning the unlearnable: The role of missing evidence,' Cognition, vol. 93, pp. 147–155.
Tenenbaum, Joshua B., and Thomas L. Griffiths (2001). 'Generalization, similarity, and
Tetlock, P. C. (2007). Giving content to investor sentiment: The role of media in the stock market. The Journal of finance, 62(3), 1139-1168. University of Massachusetts, GLSA. vol. 31, pp. 36–45.

The Asian Institute of Research
Economics and Business Quarterly Reviews
Vol.7, No.1, 2024: 14-26
ISSN 2775-9237

DOI: 10.31014/aior.1992.07.01.556

Political Risk Impacts on Foreign Direct Investment in Vietnam

Tran Binh Nguyen[1]

[1] Faculty of Business and Law, University of the West of England, Bristol, United Kingdom

Correspondence: Tran Binh Nguyen, Faculty of Business and Law, University of the West of England, Bristol, Coldharbour Lane, BS16 1QY, United Kingdom, E-mail: Nguyen9.Tran@live.uwe.ac.uk

Abstract
The research explores the impact of political risk on foreign direct investment in Vietnam. The dataset for political risk employed in this research consists of twelve factors from the International Country Risk Guide, offering a comprehensive assessment of Vietnam's political landscape. The research utilises Principal Component Analysis to consolidate twelve political risk items, examining their influence alongside GDP growth, inflation rate and trade openness. With data spanning from 1994 to 2021, ARIMA models are employed due to non-stationarity issues from secondary data set. The findings indicate that while economic factors contribute to FDI, political risk variables like governance quality, military involvement, and economic stability have profound impacts. The study suggests that enhancing governance and reducing military politics are key to attracting FDI, offering insights for policymakers and investors to navigate Vietnam's investment landscape.

Keywords: Political Risk, Foreign Direct Investment, Vietnam, International Country Risk Guide, Governance Quality, Military Involvement, Economic Stability

1. Introduction

Foreign direct investment (FDI) has emerged as a lifeblood for economic growth, especially in an increasingly interconnected global economy. It is a vital source of external financing for countries, offering more than just capital infusion; it brings in technological advancements, managerial expertise, and opens up new avenues for international trade (UNCTAD, 2019). FDI is essential for developing nations as it supplements domestic investment, often leading to higher productivity and job creation (Moosa, 2002).

The drivers of FDI are both diverse and complex, typically categorised into internal factors, such as economic stability, market size, and political condition, and external factors, which include global financial conditions and the economic performance of investor countries (Dua, 2015). Within these factors**,** political risk stands out as a

critical consideration. It encompasses the uncertainty that investors face due to the political environment in the host country, which can significantly affect the viability and profitability of investment projects (Kim, 2010).

In developing countries and particularly in Asia, the flow of FDI has been a testament to the region's dynamic economic development. Asian countries have been actively improving investment climates to attract more FDI, which is often seen as a stamp of economic credibility (Sahoo, 2006). Vietnam, in particular, has made significant strides in this arena. It has evolved from a war-torn nation to a rising star in the Asian economic landscape, attracting substantial FDI inflows (Hoang, 2014). With a rapidly growing market and a strategic location in Southeast Asia, Vietnam presents a unique case for studying the impact of PR on FDI.

This research endeavors to examine the nuanced relationship between political risk and foreign direct investment (FDI) inflows in Vietnam. The remainder of this paper is organised as follows. Section 2 reviews the theoretical analyses and literature review. Section 3 specifies the methodology employed in the study along with the estimation techniques. Section 4 provides the regression results with interpretations, and section 5 concludes the paper.

2. **Literature Review**

2.1. Political Risk and FDI inflow

The intersection of PR and FDI is a focal point of inquiry within the realm of international business and economic development literature. PR refers to the probability of disruptive political events affecting the investment climate and, consequently, the returns on investment in a particular country (Gobinda, 2014). The concept of FDI pertains to investments made by a firm or individual in one country into business interests located in another country, typically in the form of establishing business operations or acquiring business assets (Busses, 2007).

The academic landscape presents a mosaic of perspectives on the impact of PR on FDI, reflecting a spectrum of empirical findings and theoretical standpoints. The majority of empirical research reinforces the notion that heightened PR can elevate the cost of doing business internationally and diminish the attractiveness of a host country to foreign investors (Harms, 2002; Lee, 2012; Howell, 2001). While a significant portion of literature posits a negative correlation, other studies present more nuanced views. Some research indicates that certain forms of PR do not uniformly discourage FDI; instead, the effect may vary depending on the industry, investment type, and investors' risk appetite (Hoang, 2012; Asiedu, 2006). These varied results emphasise the complex interplay between PR and FDI, suggesting that a nuanced analysis of PR factors is necessary.

The relationship between PR and FDI is multifaceted, with studies highlighting various factors that influence investor decisions. Political instability and governance quality, including voice and accountability, have been identified as significant determinants of FDI inflows (Rios-Morales, 2010; Rajan and Hattari, 2009). While global research indicates that lower corruption and better contract enforcement encourage FDI (Gastanaga, 1998; Wei, 2000), findings also suggest the complexity of PR's components, such as policy volatility and cultural conflicts, which can dissuade investment (Hermes and Lensink, 2001; Goswami and Haider, 2014). In Vietnam specifically, the impact of corruption negatively affects FDI inflow (Vo and Nguyen, 2015), yet improved institutional quality has been seen to have a positive influence (Nguyen and Cao, 2015). These insights underscore the importance of nuanced approaches in both global and Vietnamese contexts to understanding PR's diverse impacts on FDI.

2.2. Macro-economic Factors and FDI Inflow

Gross domestic product (GDP) serves as a broad indicator of a country’s economic health and market size, often linked to the potential for FDI inflow. A larger GDP growth is indicative of a more substantial market, potentially

offering greater opportunities for investors (Campos, 2002, Chowdhury, 2003). Within the context of Vietnam, research has underscored the positive correlation between the country's escalating GDP and FDI attraction, suggesting that economic growth fosters a conducive investment environment (Nguyen, 2023). However, contrary viewpoints caution that a higher GDP does not automatically equate to increased FDI, particularly in markets nearing saturation where the marginal benefit of additional investment diminishes, or in highly competitive markets where the entry of new players is met with significant barriers to success (Alshamsi, 2015; Nupehewa, 2022).

Trade openness refers to a country's willingness to engage in international trade, measured by the ratio of total trade to GDP. It is posited that a higher level of trade openness correlates with increased FDI, as it reflects fewer restrictions and a welcoming attitude towards foreign investment (Klein, 1998; Chakrabarti, 2001). This is evident in Vietnam, where progressive trade liberalisation has been a key factor in the surge of FDI inflows (Hanh, 2020). However, some analysts caution that excessive openness may leave economies vulnerable to global fluctuations, potentially impacting FDI negatively by introducing greater economic risks (Raf, 2004; Seim, 2009).

Inflation is a pivotal economic indicator, measuring the average price increase of goods and services and suggesting the loss of purchasing power within an economy (Mason, 2017). Traditionally, high inflation is viewed unfavorably by foreign investors due to its potential to signal economic instability and unpredictability, leading to a negative impact on FDI inflow (Buckley et al., 2007, Ahmad, 2014). In Vietnam, persistently high inflation rates have raised concerns about economic management, which can adversely affect investor confidence and FDI (Hoang, 2020; Cung, 2020). Conversely, some economists agrue that a certain level of inflation is characteristic of dynamic, developing economies, and can be perceived as a sign of an active, growing market. Under this premise, moderate inflation could potentially attract FDI as it may promise higher returns on investment in an expanding economy (Mason, 2017).

2.3. Research Gaps

While there has been considerable research on the relationship between PR and FDI, the literature on the Asian region, and particularly Vietnam, remains limited (Nguyen and Cao, 2015; Hoang, 2020). Existing studies tend to focus on isolated aspects of PR without considering the overall panorama of PR factors (Vo and Nguyen, 2015; Wei, 2000). This study aims to address these gaps by conducting a comprehensive investigation into the impact of PR on FDI in Vietnam, considering the influence of macroeconomic factors such as trade openness, inflation, and market size.

2.4. Main Research Question

Given the identified research gaps, the main research question for this study is: "*How does political risk, in combination with macroeconomic factors, influence the inflow of foreign direct investment in Vietnam from 1994 to 2021?"*. This question is pivotal as it will enable an exploration of the specific impacts of PR on FDI inflows in Vietnam. The insights garnered from this research could offer valuable guidance for policymakers and investors in formulating strategies to optimise FDI inflows while mitigating the adverse effects of PR. This framework delineates the exploration of factors affecting FDI into Vietnam, focusing on the crucial role of political risk, GDP growth, inflation, and trade openness, to encapsulate the comprehensive economic landscape.

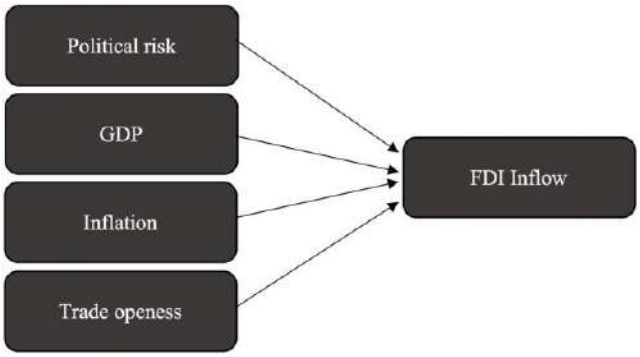


Figure 1: Research framework

3. Methodology

3.1. Research Paradigm

The study is anchored in a positivist research paradigm, emphasising objectivity and the quantifiable aspects of social phenomena (Jean, 1992). Quantitative methods are the cornerstone of the research strategy, combining with deductive approach, facilitating the measurement and analysis of variables and their relationships (Schutt, 2019). The longitudinal design of the study allows for the observation of changes over time, combining the exploratory research question can provide a dynamic view of the situation (Saldan, 2003). By prioritising statistical analysis and empirical evidence, the positivist and deductive stance enhances the study's rigor and replicability, aligning with the quantitative strategy to deliver conclusive and generalisable findings (Schutt, 2019). This approach is particularly suitable for understanding trends in FDI in response to changing economic policies and market dynamics.

3.2. Scope of the Research

The temporal scope of this study is selectively set from 1994 to 2021, despite data availability since 1986 after Vietnam initiated the Reform Policy (Lipworth, 1993). The study spans from 1994 to 2021, a timeframe chosen for its significance in Vietnam's economic journey post-trade embargo lifted in 1993 by the USA, marking a critical juncture in international trade relations (Goodman, 1993). This period witnessed substantial legislative shifts, including the Land Law in 1993, which facilitated foreign land ownership and spurred investment, reflecting a radical transformation in Vietnam's economic policies (Marsh, 2002). Analysing from 1994 allows for an exploration of FDI patterns amidst Vietnam's rapid economic integration and legislative changes, offering a rich analytical backdrop for understanding FDI's evolution in the country.

3.3. Data Collection

For data collection, the study employs World Bank’s Databank for macroeconomic variables—FDI, GDP growth, inflation rate, and trade openness—to evaluate the economic climate and investment attractiveness of Vietnam. This robust dataset ensures an accurate reflection of the country's economic state over the study period. Political risk factors are drawn from the ICRG dataset; this dataset encompasses twelve detailed items, including government stability, socioeconomic conditions, investment profile, internal conflict, external conflict, corruption, military in politics, religious tensions, law and order, ethnic tensions, democratic accountability, and bureaucracy quality. High scores indicate favorable conditions for investors, while low scores denote risk areas. The ICRG indices are favored due to their comprehensive coverage across multiple dimensions of PR and their extensive country and yearly coverage, outperforming other available measures of institutional quality (Rafat, 2019).

3.4. Data analysis

The initial stage involves preparing the dataset to facilitate Principal component analysis (PCA). This process aims to reduce the number of PR factors from the initial twelve items, thus avoiding multicollinearity (Kurita, 2019). Before implementing PCA, the dataset undergoes evaluation through the Kaiser-Meyer-Olkin (KMO) test and Bartlett's test, ensuring adequacy for the reduction of dimensions. Successful PCA leads to the use of correlation tests to establish the strength and significance of the components, also scree plot can inform the number of reduced components (Kurita, 2019). A pivotal aspect of methodology is Stationarity testing for time series data. The Augmented Dickey-Fuller (ADF) test is employed to assess the stationarity of the data (Dolado, 2002). If the data proves to be stationary, Ordinary Least Squares (OLS) regression is employed for analysis. Conversely, if the data exhibits non-stationary characteristics, Auto Regressive Integrated Moving Average (ARIMA) model is utilised as they are better suited for non-stationary data. Following regression analysis, statistical tests such as the Portmanteau, Skewness, and Kurtosis tests validate the model's accuracy (Kinney, 1978). The results section then interprets the findings, providing a narrative that connects statistical outcomes with the literature context.

3.5. Limitations

While the study employs a quantitative and deductive framework, it recognises that this approach may not capture all the complexities of FDI influences. Specifically, the reliance on numerical analysis may overlook some qualitative factors that could provide additional insight into the behaviors influencing economic investment (Ochieng, 2009). Another significant limitation arises from the use of secondary data, which often encounters non-stationarity issues, making time-series analysis challenging (Cheng, 2014). Moreover, the dataset spanning from 1994 to 2021, while extensive, offers limited annual observations due to data access constraints, potentially impacting the robustness of statistical inferences (Cheng, 2014).

4. **Results and Findings**

4.1. Principal Component Analysis

Table 1: KMO and Bartlett’s test

KMO Measure			
Government Stability	0.4523	Military in Politics	0.7115
Socioeconomic Conditions	0.7333	Religious Tensions	0.7064
Investment Profile	0.5609	Law and Order	0.5542
Internal Conflict	0.6602	Ethnic Tensions	0.7253
External Conflict	0.2934	Democratic Accountability	0.6101
Corruption	0.5486	Bureaucracy Quality	0.3059
Overall KMO	**0.6044**		
Bartlett's Test of Sphericity:			
Chi-Square (χ^2): 415.81			
Degrees of Freedom (df): 66			
Significance (Prob>χ^2): < 0.0001			

The PCA conducted in the study begins with an assessment of the data's adequacy through the KMO and Bartlett's test (Table 1). With an overall KMO value of 0.6044, the dataset is considered marginally suitable for PCA, while

Bartlett's test confirms significant correlations among variables, indicating the dataset's appropriateness for the analysis (Dunteman, 1989).

Table 2: Correlation Matrix

	GS	SE	IP	IC	EC	CO	MP	RT	LO	ET	DA	BQ
GS	1.000											
SE	0.0809	1.000										
IP	0.0306	-0.2421	1.000									
IC	0.1183	0.7052**	-0.6990**	1.000								
EC	0.4201*	-0.3872*	-0.1425	-0.2003	1.000							
CO	-0.2460	-0.0133	0.1306	0.0774	-0.1041	1.000						
MP	-0.2910	-0.5439**	0.7566***	-0.7120***	-0.0725	0.2894	1.000					
RT	0.4030*	0.4190*	-0.7188***	0.6361***	0.0825	-0.3887	-0.9607***	1.000				
LO	0.1994	0.5269**	-0.8011***	0.9159***	-0.1356	0.0110	-0.7644***	0.7432***	1.000			
ET	0.0341	0.6712***	-0.6478***	0.7820***	-0.0810	0.0934	-0.8331***	0.6829***	0.7461***	1.000		
DA	-0.5403**	0.3671*	-0.0633	0.2396	-0.3327*	0.4483**	-0.0990	-0.1209	0.1148	0.5684**	1.000	
BQ	0.2843	-0.3518*	0.2538	-0.3217	-0.0338	-0.2102	0.2576	-0.0861	-0.0463	-0.4607**	-0.4671**	1.000

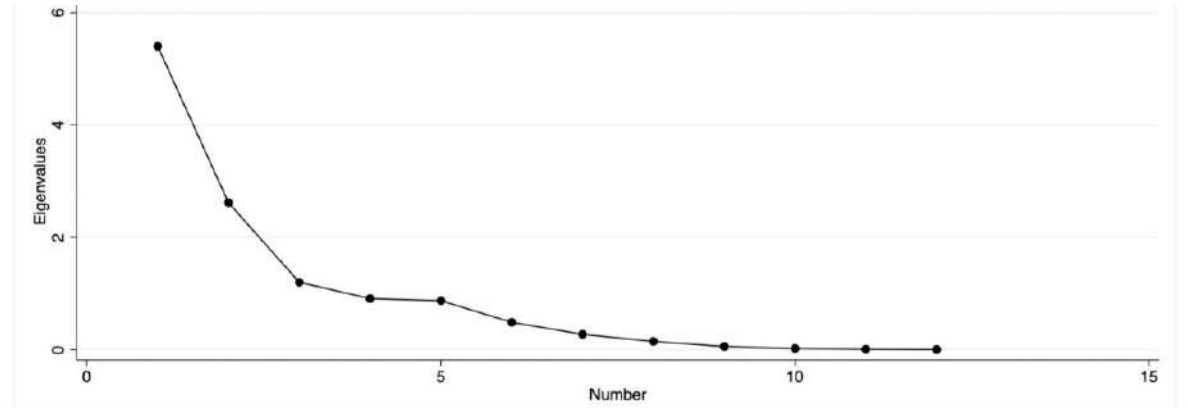


Figure 2: Scree Plot after PCA

Looking at the correlation matrix (Table 2), the PCA identifies significant interconnections among the PR indicators. The scree plot (Figure 2) is crucial as it informs the subsequent retention of three principal components based on their eigenvalues, which surpass the accepted one unit threshold (Lansangan, 2009). This PCA process helps simplifying the dataset while retaining the most significant variables for further analysis.

Table 3: Pattern Matrix

Variable	Comp1	Comp2	Comp3
Government Stability	0.1376	**-0.4192**	-0.1397
Socioeconomic Conditions	0.2123	0.0575	**0.4179**
Investment Profile	-0.3861	-0.0400	0.1707
Internal Conflict	0.3530	0.0521	0.2019
External Conflict	0.1263	-0.0169	**-0.7756**
Corruption	-0.0655	**0.4339**	-0.0561
Military in Politics	**-0.4224**	0.0792	0.0306
Religious Tensions	0.3946	-0.2235	-0.0075
Law and Order	0.3641	-0.0758	0.1833
Ethnic Tensions	0.3784	0.2172	0.0311
Democratic Accountability	0.0462	**0.5286**	0.1254
Bureaucracy Quality	-0.1733	**-0.4894**	0.2826

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

In the pattern matrix (Table 3), a threshold of 0.4 helps isolate the most representative variables for each component (Lansangan, 2009). Although the original twelve PR factors are reduced to three principal components, only seven are explained due to the limitations imposed by the limited yearly data. This strategic condensation allows for a focused analysis, each component reflects a distinct influence on PR as it pertains to governance and policy-making in Vietnam (Table 4).

Table 4: Factor Names and Component Variables

Military Influence (MI)	Governance Quality (GQ)	Economic Equilibrium (EE)
Military in Politics	Government Stability	Socioeconomic Conditions
	Corruption	
	Democratic Accountability	External Conflict
	Bureaucracy Quality	

The first component, reflecting MI, is significantly influenced by "Military in Politics," demonstrating the military's substantive role in governance and policy-making. The second component, denoting GQ, includes variables such as "Government Stability" and "Corruption," which collectively indicate the level of bureaucratic efficiency and integrity. The third component, representing "EE," captures elements like "Socioeconomic Conditions" and "External Conflict," encapsulating both the country's internal economic health and its external geopolitical relationships.

4.2. Stationarity Testing

The stationarity of the time-series data is a prerequisite for many time-series analyses (Dickey & Fuller, 1979). The application of the ADF test and subsequent differencing suggests that the initial data exhibited non-stationary characteristics, necessitating transformations to achieve stationarity before further analysis. The results lead to the rejection of OLS regression due to the data's limited stationary observations, prompting the use of ARIMA models suitable for non-stationary data (Jong, 1994). Comprehensive details and results of the stationarity testing are documented in the ***Appendix section*** of this report.

4.3. ARIMA Modeling

Table 5: Variables List

Variable	Label	Interpretation
Foreign Direct Investment	FDI	Foreign Direct Investment Inflow (Billion USD)
GDP Growth	GDP	Logarithm of annual GDP growth (percentage)
Inflation Rate	INF	Logarithm of annual Inflation rate (percentage)
Trade Openess	OPN	Logarithm of the trade openess index
Military Influence	VPCA1	Generated by the result of Componet 1 after PCA
Governance Quality	VPCA2	Generated by the result of Componet 2 after PCA
Economic Equilibrium	VPCA3	Generated by the result of Componet 3 after PCA

In the context of macroeconomic variables, logarithmic transformations are applied to stabilize the variance, which is particularly beneficial for data that may exhibit exponential growth patterns or skewed distributions, thus facilitating a more accurate econometric evaluation (Kirui, 2014). The ICRG's PR scales are designed to directly quantify the aspects of a nation's political environment without the need for logarithmic transformation, ensuring the data's original structure is maintained for time-series analysis.

Table 6: KMO and Bartlett's test before ARIMA

KMO Measure			
FDI	0.5972	MI	0.4903
INF	0.6619	GQ	0.3204
GDP	0.6032	EE	0.2628
OPN	0.6237		
Overall KMO	**0.5253**		
Bartlett's Test of Sphericity:			
Chi-squared (χ^2): 118.82			
Degrees of Freedom (df): 21			
Probability (Prob>χ^2): < 0.0001			

The ARIMA model's variables undergo a second KMO and Bartlett test, ensuring that the new variables derived from the PCA are suitable for time-series modeling. Despite the lower overall KMO score of 0.5253, Bartlett's test indicates some relationships between the variables are strong enough to proceed with the ARIMA modeling (Dunteman, 1989).

Table 7: ARIMA Regression

Sample: 1994 to 2021				Wald chi2: 668.58		
Number of observations: 26				Prob > chi2: 0.000		
	Coefficient	S.E.	z	P > |z|	95% conf. Interval	
GDP	-3.25e+0.9	1.48e+0.9	-2.20	0.025	-6.15e+0.9	-1.15e+0.8
INF	-9.18e+0.8	4.10e+0.8	-2.24	0.028	-1.72e+0.9	-3.55e+0.8
OPN	2.56e+0.9	5.74e+0.8	4.46	0.000	1.44e+0.9	3.69e+0.9
MI	-1.60e+0.9	2.22e+0.8	-7.20	0.000	-2.03e+0.9	-1.16e+0.9
GQ	9.66e+0.8	2.34e+0.8	4.13	0.000	5.07e+0.8	1.42e+0.9
EE	1.55e+0.9	2.79e+0.8	5.56	0.000	1.00e+0.9	2.09e+0.9

In the ARIMA regression analysis, all six variables demonstrate a significant impact on FDI in Vietnam, as evidenced by the robust Wald chi^2 statistic of 668.58 and significant p-value. The ARIMA model's robust standard errors address the potential heteroscedasticity, providing more reliable coefficient estimates for the time-series analysis (Bianco, 1996). This approach compensates for irregularities in the error term's variance, which is essential when the dataset does not fulfill the homoscedasticity assumption (Mansournia, 2021).

Table 8: Statistical Test

Portmanteau Test for White Noise (Q-test):
Portmanteau (Q) Statistic: 17.7025
Prob > chi2(11): 0.0887
Skewness and Kurtosis Test for Normality of Residuals:
Adjusted Chi-Squared (2 df): 2.74
Prob > chi2: 0.2538

Following the ARIMA regression, statistical tests are conducted to validate the reliability of the model. The Portmanteau test suggests that the ARIMA model's residuals, while not perfectly random, capture a substantial portion of the data's variability, indicating a satisfactory fit (Ljung & Box, 1978). Concurrently, normality tests on residuals, such as Skewness and Kurtosis, confirm adherence to the model's assumptions (Thode, 2002). Moreover, the AIC/BIC test for model selection and MSE/RMSE for predictive accuracy will add depth to the model evaluation, detailed discussions and results are reserved for the Appendix to maintain focus on the main findings (table 10).

4.4. Analysing Regression Output

Table 9: Relationship between variables

Relationships	Coefficient	S.E.	P-Value	Results
GDP → FDI	-3.25e+0.9	1.48e+0.9	*	Negative
INF → FDI	-9.18e+0.8	4.10e+0.8	*	Negative
OPN → FDI	2.56e+0.9	5.74e+0.8	***	Positive
MI → FDI	-1.60e+0.9	2.22e+0.8	***	Negative
GQ → FDI	9.66e+0.8	2.34e+0.8	***	Positive
EE → FDI	1.55e+0.9	2.79e+0.8	***	Positive
*Note: ***p <0.001, **p<0.01, *p<0.05*				

Overall, all six variables have a significant impact on FDI. Specifically, the variables INF, GDP and MI indicate a negative relationship with FDI. Conversely, OPN, GQ and EE have positive coefficients, signifying a favorable effect on FDI inflows. Among these, GDP presents the strongest negative influence, underscoring the critical impact of economic growth in attracting foreign investment. Whereas, OPN and GDP present as the two most impactful factors, with OPN showing the most substantial positive influence on FDI, the underpinnings of political stability and governance are equally vital, demonstrating that PR exerts a substantive effect on FDI inflows.

Macroeconomic Factors Impacting FDI: The macroeconomic environment of Vietnam significantly influences FDI. Higher inflation rates correspond with decreased foreign direct investment, which aligns with the theory that inflation creates economic uncertainty and can deter investors (Ahmad, 2014; Hoang, 2020). Conversely, a more open trade environment has a favorable effect on FDI, supporting the idea that policies promoting trade and economic integration can attract foreign investors by providing access to larger markets and the opportunity to join global supply chains (Klein, 1998; Hanh, 2020). Interestingly, an inverse relationship between GDP growth and FDI suggests that during periods of economic expansion, Vietnam might be less reliant on foreign investment, or FDI might be directed towards sectors that do not directly contribute to immediate GDP growth (Nupehewa, 2022).

Military Influence: Investors typically shy away from significant military control in governance, as indicated by the negative coefficient for military involvement (Wisniewski, 2014). This apprehension is exemplified by countries, where military interventions have resulted in economic sanctions and political instability, undermining investor confidence and creating a volatile environment for FDI (Alesina & Perotti, 1996).

Governance Quality: The positive impact of governance quality on FDI inflows suggests investors' preference for reliable and transparent institutions. Countries exemplifying high governance quality, like Singapore, tend to draw more investors, who view these attributes as indicators of a lower-risk business environment (Nguyen and Cao, 2015). Good governance is associated with predictability and fairness in business regulations, which are critical for long-term investment strategies (Dinh et.al., 2019).

Economic Equilibrium: A stable macroeconomic environment, as denoted by the positive association with the EE component, is crucial for attracting FDI. For example, nations that manage to maintain economic stability even during global crises are seen as safe havens for investors seeking to minimise exposure to financial volatility, offer a predictable and secure investment climate, which is a significant determinant for investors when allocating capital (Levchenko & Mauro, 2007).

5. Conclusion and Recommendation

This study sheds light on the nuanced impact of political risk (PR) on foreign direct investment (FDI) in Vietnam, emphasizing governance quality, military involvement, and economic stability as significant factors alongside traditional macroeconomic indicators. It suggests that robust governance and minimal military interference in politics are essential for attracting FDI. The research calls for more comprehensive future studies to refine these findings further. For Vietnam's policymakers, the path to increased FDI lies in strengthening institutional integrity

and ensuring political stability. Investors, in turn, should closely evaluate Vietnam's political and economic environment to capitalize on its integration into the global market. Overall, this study highlights the critical convergence of economic and political dynamics in formulating effective investment strategies in Vietnam.

Author Contributions: All authors contributed to this research.

Funding: Not applicable.

Conflict of Interest: The authors declare no conflict of interest.

Informed Consent Statement/Ethics Approval: Not applicable.

References

Ahmad, S. T., & Rashid, H. (2014). *Impact of trade openness, FDI, exchange rate and inflation on economic growth: A case study of Pakistan*. International Journal of Accounting and Financial Reporting, 4(2), 236.

Alesina, A., & Perotti, R. (1996). *Income distribution, political instability, and investment*. European economic review, 40(6), 1203-1228.

Alshamsi, K. H., & Azam, M. (2015). *The impact of inflation and GDP per capita on foreign direct investment: the case of United Arab Emirates*. Investment management and financial innovations, (12, Iss. 3 (contin.)), 132-141.

Asiedu (2006). *Foreign Direct Investment to Africa: The Role of Government Policy, Governance and Political Instability*. World Economy. Vol. 29 (1), pp. 63-77

Bianco, A. M., Martinez, E. J., Ben, M. G., & Yohai, V. J. (1996). *Robust procedures for regression models with ARIMA errors*. In COMPSTAT: Proceedings in Computational Statistics 12th Symposium held in Barcelona, Spain, 1996 (pp. 27-38). Physica-Verlag HD.

Buckley, P. J., Devinney, T. M., & Louviere, J. J. (2007). *Do managers behave the way theory suggests? A choice-theoretic examination of foreign direct investment location decision-making*. Journal of international business studies, 38, 1069-1094.

Burnham, K. P., & Anderson, D. R. (2004).*Multimodel inference: understanding AIC and BIC in model selection*. Sociological methods & research, 33(2), 261-304.

Busse, Matthias, and Carsten Hefeker (2007).*Political Risk, Institutions and Foreign Direct Investment* European Journal of Political Economy 23, no. 2: 397–415.

Campos, N. F., & Kinoshita, Y. (2002).*Foreign Direct Investment as Technology Transferred: Some Panel Evidence from the Transition Economies*. Center for Economic Policy Research. Discussion Paper No. 3417.

Chakrabarti, A. (2001).*The determinants of foreign direct investment: Sensitivity analyses of cross-country regressions*. KYKLOS, 54, 89–112.

Cheng, H. G., & Phillips, M. R. (2014).*Secondary analysis of existing data: opportunities and implementation* Shanghai archives of psychiatry, 26(6), 371.

Chowdhury, A., & Mavrotas, G. (2003).*Foreign direct investment and growth: what causes what. Department of Economics*, Marquette University, USA, World Institute Development Economic Research/United Nations University.

Cung, N. H. (2020).*Impact of foreign direct investment on economic growth in Vietnam*. Advances in Management and Applied Economics, 10(2), 1-6.

Dickey, D. A., & Fuller, W. A. (1979). *Distribution of the estimators for autoregressive time series with a unit root*. Journal of the American statistical association, 74(366a), 427-431

Dinh, T. T. H., Vo, D. H., The Vo, A., & Nguyen, T. C. (2019).*Foreign direct investment and economic growth in the short run and long run: Empirical evidence from developing countries*. Journal of Risk and Financial Management, 12(4), 176.

Dolado, J. J., Gonzalo, J., & Mayoral, L. (2002).*A fractional Dickey–Fuller test for unit roots*. Econometrica, 70(5), 1963-2006.

Dua, P. and Garg, R. (2015), *Macroeconomic determinants of foreign direct investment: evidence from India*, The Journal of Developing Areas, Vol. 49 No. 1, pp. 133-155

Dunteman, G. H. (1989). *Principal components analysis* (Vol. 69). Sage.

Gastanaga, V. M., Nugent, J. B., & Pashamova, B. (1998). *Host country reforms and FDI inflows: How much difference do they make?*. World development, 26(7), 1299-1314.

Gobinda Goswami, G. and S. Haider (2014).*Does political risk deter FDI inflow? An analytical approach using panel data and factor analysis*. Journal of Economic Studies 41(2): 233-252.

Goldberg, L. S., & Klein, M. W. (1998). *Foreign direct investment, trade and real exchange rate linkages in Southeast Asia and Latin America*. In R. Glick (Ed.), Managing capital flows and exchange rates: Perspectives from the pacific basin (pp. 73–100). Cambridge: Cambridge University Press.

Goodman, A. E. (1993).*Vietnams Post-Cold War Diplomacy and the US Response*. Asian Survey, 33(8), 832-847.

Goswami, G. G., & Haider, S. (2014).*Does political risk deter FDI inflow? An analytical approach using panel data and factor analysis.* Journal of Economic Studies, 41(2), 233-252.

Hanh, P. T. H. (2020).*Determinants of FDI into China and Vietnam: A comparative study*. Korea and the World Economy, 21(1), 35-73.

Harms, P., & Ursprung, H. (2002).*Do Civil and Political Repression Really Boost Foreign Direct Investments?* Economic Enquiry, 40(4), 651-663. https://doi.org/10.1093/ei/40.4.651

Hattari, R., & Rajan, R. S. (2009).*Understanding bilateral FDI flows in developing Asia.* Asian-Pacific Economic Literature, 23(2), 73-93.

Hayakawa, K., Kimura, F., & Lee, H-H. (2012).*How Does Country Risk Matter for Foreign Direct Investment?* ERIA discussion paper No. 281. https://doi.org/10.1111/deve.12002

Hermes, N., & Lensink, R. (2003).*Foreign direct investment, financial development and economic growth.* The journal of development studies, 40(1), 142-163.

Hoang, H.H. (2012).*Foreign direct investment in Southeast Asia determinants and spatial distribution*. DEPOCEN Working Paper Series No. 2012/30.

Hoang, H.H. and Goujon, M. (2014).*Determinants of foreign direct investment in vietnamese provinces: a spatial econometric analysis* Post-Communist Economies, Vol. 26 No. 1, pp. 103-121.

Hoang, T., Thi, V., & Minh, H. (2020).*The impact of exchange rate on inflation and economic growth in Vietnam*. Management Science Letters, 10(5), 1051-1060.

Howell, L. D. (2001).*The Handbook of Country and Political Risk Analysis* (3rd ed.). The PRS Group: East Syracuse, NY.

Hyndman, R. J., & Koehler, A. B. (2006). *Another look at measures of forecast accuracy*. International journal of forecasting, 22(4), 679-688.

Jean Lee, S. K. (1992).*Quantitative versus qualitative research methods—Two approaches to organisation studies*. Asia Pacific Journal of Management, 9, 87-94.

Jong, P. D., & Chu-Chun-Lin, S. (1994).*Stationary and non-stationary state space models*. Journal of Time Series Analysis, 15(2), 151-166.

Khan, M. M., & Akbar, M. I. (2013).*The impact of political risk on foreign direct investment.*

Kim, H. (2010), *Political stability and foreign direct investment*, International Journal of Economics and Finance, Vol. 2 No. 3, p. 5971.

Kinney Jr, W. R. (1978).*ARIMA and regression in analytical review: An empirical test*. Accounting Review, 48-60.

Kirui, E., Wawire, N. H., & Onono, P. A. (2014). *Macroeconomic variables, volatility and stock market returns: a case of Nairobi securities exchange, Kenya*.

Kurita, T. (2019).*Principal component analysis (PCA)*. Computer Vision: A Reference Guide, 1-4.

Lansangan, J. R. G., & Barrios, E. B. (2009).*Principal components analysis of nonstationary time series data*. Statistics and Computing, 19, 173-187.

Levchenko, A. A., & Mauro, P. (2007).*Do some forms of financial flows help protect against "sudden stops"?*. The World Bank Economic Review, 21(3), 389-411.

Lipworth, G., & Spitäller, E. (1993).*Viet Nam-Reform and Stabilization*, 1986-92.

Ljung, G. M., & Box, G. E. (1978).*On a measure of lack of fit in time series models*. Biometrika, 65(2), 297-303.

Mansournia, M. A., Nazemipour, M., Naimi, A. I., Collins, G. S., & Campbell, M. J. (2021). *Reflection on modern methods: demystifying robust standard errors for epidemiologists*. International Journal of Epidemiology, 50(1), 346-351.

Marsh, S. P., & MacAulay, T. G. (2002).*Land reform and the development of commercial agriculture in Vietnam: policy and issues*. Australasian Agribusiness Review, 10, 1-19.

Mason, R. L., & Vracheva, V. (2017).*The impact of inflation targeting on attracting foreign direct investment*. Journal of Applied Business and Economics, 19(4), 79-94.

Moosa, I.A. (2002).*Foreign Direct Investment: Theory, Evidence and Practice*, Palgrave Macmillan

Nguyễn, H. V., & Phan, T. T. (2023).*Impact of economic growth, international trade, and FDI on sustainable development in developing countries*. Environment, Development and Sustainability, 1-27.

Nguyen, T. V. H., & Cao, T. H. V. (2015).*The impact of institutional quality on foreign direct investment (FDI).inflows to Vietnam*. EADN Working Pap, 86, 28.

Nupehewa, S., Liyanage, S., Polkotuwa, D., Thiyagarajah, M., Jayathilaka, R., & Lokeshwara, A. (2022).*More than just investment: Causality analysis between foreign direct investment and economic growth*. Plos one, 17(11), e0276621.

Ochieng, P. A. (2009).*An analysis of the strengths and limitation of qualitative and quantitative research paradigms*. Problems of Education in the 21st Century, 13, 13.

Rafat, M., & Farahani, M. (2019).*The country risks and foreign direct investment (FDI)*. Iranian Economic Review, 23(1), 235-260.

Raff, H. (2004).*Preferential trade agreements and tax competition for foreign direct investment*. Journal of Public Economics, 88(12), 2745–2763.

Rios-Morales, R., & Brennan, L. (2010).*The emergence of Chinese investment in Europe*. EuroMed Journal of Business, 5(2), 215-231.

Sahoo, P. (2006), *Foreign direct investment in south Asia: policy, trends, impact and determinants*, ADB Institute Discussion paper No. 56, Asian Development Bank Institute, available at: www. econstor.eu/handle/10419/53445

Saldaña, J. (2003). *Longitudinal qualitative research: Analyzing change through time. Rowman Altamira.*

Schutt, R. K. (2019). *Quantitative methods. The Wiley Blackwell Companion to Sociology*, 39-56.

United Nations Conference on Trade and Development. (2019). World Investment Report 2019. United Nations.

Vo.V.Dut, & Nguyen.T.P.N. (2015). *Ảnh hưởng của tham nhũng đến dòng vốn đầu tư trực tiếp nước ngoài vào các quốc gia Châu Á.* Tạp Chí Khoa Học Đại Học Mở Thành Phố Hồ Chí Minh-Kinh Tế Và Quản Trị Kinh Doanh, 10(3), 162-172.

Wei, Y., Siler, P., Wang, C., & Liu, X.. (2000).*Productivity spillovers from foreign direct investment: Evidence from UK industry level panel data*. Journal of International Business Studies, 31, 407-425.

Wisniewski, T. P., & Pathan, S. K. (2014).*Political environment and foreign direct investment: Evidence from OECD countries*. European Journal of Political Economy, 36, 13-23.

Appendix

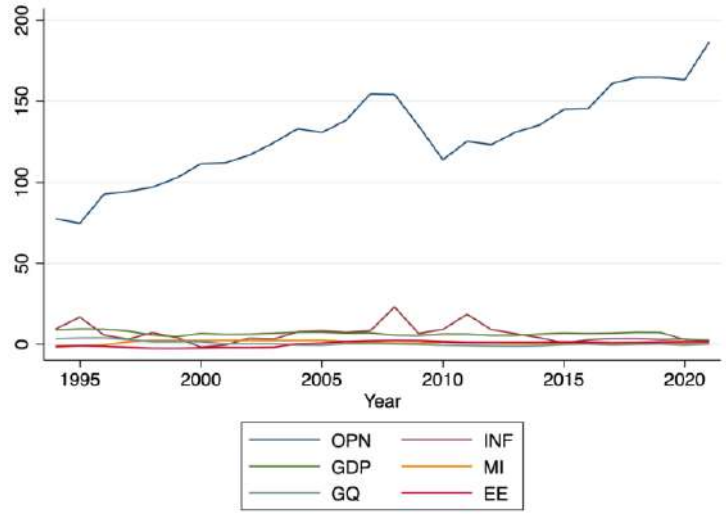


Figure 3: Stationary testing raw data

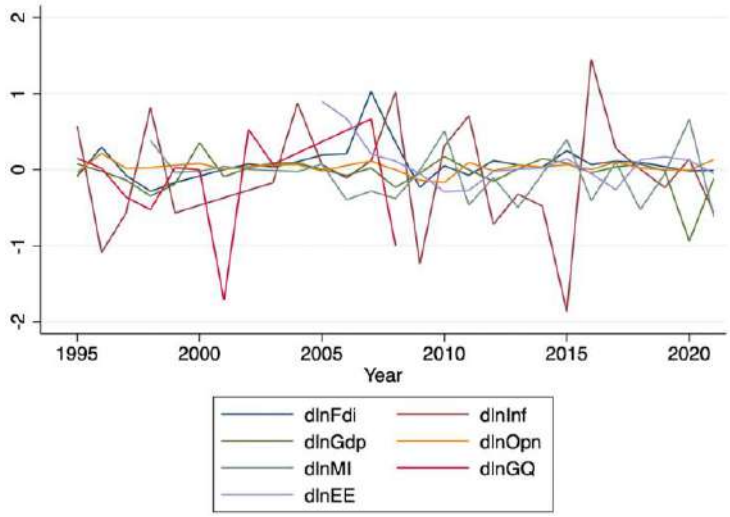


Figure 4: Stationary testing differencing data

Table 10: Statistical test ARIMA

Akaike's Information Criterion (AIC) and Bayesian Information Criterion (BIC):
AIC: 1198.443
BIC: 1207.25
Mean Squared Error (MSE) and the Root Mean Square Error (RMSE)
MSE: 3.565e+18
RMSE: 1.888e+09
Variance FDI: 2.924e+19

The Asian Institute of Research
Economics and Business Quarterly Reviews
Vol.7, No.1, 2024: 27-40
ISSN 2775-9237

DOI: 10.31014/aior.1992.07.01.557

Towards Embracing Effective Governance in Tanzania Financial Sector: Does Institutional Quality Influence Banking Sector Financial Depth?

Josephat Lotto[1]

[1] The Institute of Finance Management. Email: tathioga@yahoo.co.uk

Abstract
This paper aimed at examining the influence of institutional quality on the banking sector's financial depth in Tanzania for a period between 1991 and 2022. In this paper institutional quality is measured by control of corruption, rule of law, government effectiveness, and regulatory quality. The paper employed secondary data from World Bank Governance development indicators and World Bank financial development indicators. A robust regression model was used to analyse data. The paper found that control of corruption, rule of law and regulatory quality have a positive influence on the banking sector financial depth while only government effectiveness influence negatively the banking sector financial depth. The findings imply that improved control of corruption, appropriately following rule of law can lead to a more transparent and accountable regulatory environment, which in turn fosters greater confidence in the banking sector, and also effective government policies attract fast deepening of financial sector. Eventually, to enhance institutional quality towards deepening banking sector depth in Tanzania, the government should focus on enhancing anti-corruption efforts and promoting transparency and accountability in both the public and private sectors. On the other hand, strategies to enhance inter-agency coordination, streamlining decision-making processes, and improving public service delivery in areas affecting the banking sector should be developed and implemented. Finally, the government should focus on strengthening its legal and regulatory frameworks with emphasis on promoting fair and impartial dispute resolution, protecting property rights, and enforcing contracts.

Keywords: Financial Depth, Control of Corruption, Rule of Law, Government Effectiveness, Regulatory Quality

1. Introduction

Financial deepening refers to the expansion of the range of financial services and instruments available to households and businesses, World Bank, (2019). The availability of a diverse range of financial services and instruments, enables savers to allocate their funds more efficiently and enables firms to access a wider range of financing options, Blancher *et al* (2019). By providing credit to the private sector, banks can contribute to financial deepening, which ultimately leads to a more efficient financial system and higher economic growth. The importance of the banking sector's financial intermediation role in allocating funds from savers to borrowers has long been recognized in the economic literature (Vera Martin *et al,* 2018). The banking sector plays a crucial role

in financing economic activities by providing credit to private sector entities which fuels economic growth and development by enabling investment, consumption, and production activities, Poghosyan, (2022).

Governments around the world have recognized the importance of banking to economic development, and they have taken various measures to create a conducive environment that ensures the deepening of financial services, mainly through the banking sector, Sanga & Aziakpono, (2022). Most governments, attempt to design and implement programs and policies which guide their economies to achieving higher financial depth of the banking sector through increasing access to financial services, such as providing incentives for banks to open branches in rural areas or offering financial education to underserved populations or investment in financial technology (Aluko & Ibrahim, 2020).

One of the important segments aligned by many developing countries to foster financial depth of the banking sector through credit is the existence of good and effective governance through institutional quality. Institutional quality refers to the overall strength and effectiveness of a country's institutions, including its government, legal system, regulatory framework, and other formal and informal institutions that shape the behavior of individuals and organizations within the society (Khan *et al,* 2020a). One way to strength the institutional quality is by reforms and strength countries rule of law, government effectiveness, quality of legal system, and control of corruption (Bongomin *et al,* 2018). Through institutional quality, one of the ways that governments have encouraged the financial depth the banking sector is by enacting laws and regulations that govern the sector through regulators or central bankers (Fagbemi & Ajibike, 2018). These laws and regulations are designed to ensure that banks operate in a safe and sound manner, protect the interests of depositors, and provide a level playing field for all players in the sector. In addition, they help to promote competition, innovation, and efficiency in the sector.

In the context of the banking sector, institutional quality plays a crucial role in determining the depth and effectiveness of financial intermediation. When institutions are strong and effective, they provide a stable and predictable environment for banks to operate in, which fosters confidence among depositors and investors (Sanga & Aziakpono, 2022). While the rule of law ensures that contracts are enforced, property rights are protected, and disputes are resolved fairly, government effectiveness provides the ability of the government to deliver public goods and services, regulate the financial sector, and maintain macroeconomic stability (Kwenda & Chinoda, 2019). On the other hand, a well-functioning legal system provides banks with legal remedies to recover their loans, which reduces their credit risk and encourages them to lend more (Sanga, & Aziakpono, 2022).

Despite significant efforts by many developing countries to foster financial depth through institutional quality improvements, the level of banking sector financial depth remained lower than that of developed countries. According to data from the World Bank (2022), the average ratio of total bank deposits to GDP in high-income countries was 121%, while the average for low-income countries was only 25%. Similarly, the average ratio of domestic credit to the private sector to GDP in high-income countries was 126%, while the average for low-income countries was only 29%. These statistics highlight the significant disparities between developed and developing countries in terms of banking sector financial depth.

In Tanzania, the banking sector has been expanding rapidly in recent years, with increased financial inclusion and technological advancements. According to World Bank (2022), most recently, the growth rate of credit to the private sector increased from 3.2 percent in 2021 to 20.7 percent in 2022, and most recent BOT report, (2023) shows that liquidity in banks was maintained at adequate levels, private sector credit growth was high at around 21%, and monetary targets set forth under the Extended Credit Facility (ECF) were achieved. This trend is significant as it indicates an increase in financial inclusion and access to credit for businesses and individuals in Tanzania. Such a banking sector performance, elsewhere in literature, is associated with institutional quality. However, there is no empirical evidence, in Tanzania, of the influence of institutional quality on the banking sector financial depth. Therefore, this paper is conducted to examine empirically, the influence of institutional quality on the banking sector's financial depth in Tanzania.

2. Related Literature

2.1 Theoretical Underpinning

According to Aluko and Ibrahim (2020) institutional quality is "the extent to which formal rules and informal norms and practices promote economic and social outcomes, including sustainable growth, equitable distribution of resources, and poverty reduction. Bongomin *et al* (2018) consider institutional quality as a crucial determinant of economic and social development, and that countries with higher institutional quality tend to have better development outcomes. Effective and efficient institutions can also provide a supportive environment for businesses to thrive and for individuals to access public services, leading to improved social outcomes (Khan *et al*, 2020a).

North (1990) proposed the Institutional Quality Theory, which suggests that the quality of a country's institutions, has a significant impact on its economic performance and outcomes. According to North, (1990), countries with stronger institutions are more likely to experience economic growth and development. The Institutional quality theory posits that the quality of institutions, including the rule of law, voice and accountability, regulatory quality, control of corruption, and government effectiveness, influences economic growth and development (Acemoglu & Robinson, 2012). The rule of law is a crucial component of institutional quality, as it provides a stable and predictable legal environment for economic activity to take place (World Bank, 2019). Voice and accountability are also important for promoting good governance, as they ensure that leaders are responsive to the needs and preferences of citizens (Kaufmann *et al,* 2010). Regulatory quality is another dimension of institutional quality, and it promotes investment and entrepreneurship by providing clear and predictable regulations that are enforced fairly and consistently (World Bank, 2019). Control of corruption is also critical for economic growth and development, as corruption can discourage investment and hinder economic activity (Mauro, 1995). Finally, government effectiveness is necessary for providing basic public goods and services that support economic activity (Kaufmann et al, 2010).

2.2 Empirical Literature

There is a growing body of empirical literature analyzing the effects of institutional factors and financial depth with inconclusive results. Baidoo and Agyapong (2022) investigated the relationship between financial development and institutional quality in emerging economies, and found that institutional quality has a positive and significant effect on financial development and that improving institutional quality, promotes financial development.

Sanga and Aziakpono's (2022) examined the impact of institutional factors on financial deepening in African countries and found that political stability, government effectiveness, regulatory quality, and rule of law have a positive and significant impact on financial deepening, while corruption has a negative and significant effect.

Aluko and Ajayi (2018) conducted a study on banking sector development in 25 Sub-Saharan African countries examining various determinants of banking sector development, and found that institutional quality, as measured by an arithmetic mean of six Worldwide Governance Indicators (WGIs) (government effectiveness, regulatory quality, rule of law, control of corruption, political stability, and voice and accountability), had a positive impact on credit to the private sector as a proxy for banking sector depth.

Ntow-Gyamfi *et al.* (2019) examined the relationship between regulatory quality, financial development, and inclusive growth in 48 African countries and found that regulatory quality, when interacting with financial development, had a positive and significant effect on inclusive growth. The authors used regulatory quality as an indicator of institutional quality and domestic credit to the private sector as a proxy for financial development.

Aluko and Ibrahim (2020) analyzed the impact of financial development on economic growth in 28 SSA countries using WGI institutional qualities namely government effectiveness, regulatory quality, rule of law, control of corruption, political stability, and voice and accountability, as a regime-switching mechanism through threshold

analysis. Their findings show that institutional quality positively affect the financial development of the selected countries

Kebede *et al.* (2021) studied the interaction between foreign banks, institutional quality, and financial inclusion in 17 African countries using principal component analysis (PCA) to construct an institutional index from WGIs, including government effectiveness, regulatory quality, rule of law, control of corruption, political stability, and voice and accountability. The study used financial inclusion as the dependent variable and foreign bank presence and the institutional quality index as the independent variables. The results showed that the institutional quality highly matters.

Khan *et al* (2020) examined the relationship between institutional quality and financial development in 189 developing and emerging economies and found that better institutional quality, as measured by variables such as government effectiveness, regulatory quality, and control of corruption, leads to greater financial development in developing and emerging economies.

Khan *et al* (2020) investigated the impact of institutional quality on financial development in emerging and growth-leading economies, and found that the effect of institutional quality on financial development is greater in countries with higher levels of economic development.

Fagbemi and Ajibike's (2018) examined the relationship between institutional quality and financial sector development in Nigeria using Auto-Regressive Distributed Lag (ARDL) bounds test approach to cointegration. Using two different indicators (Private credit and M2) of financial development, the results consistently show that institutional factors do not have significant effect on financial development in the long – run as well as in the short – run. Furthermore, the empirical evidence indicates that regulatory quality and governance system (institutions) do not necessarily contribute to financial development in a feeble institutional environment like Nigeria.

Sarhangi *et al*. (2021) conducted a study on the impact of effective governance and regulatory quality on financial development in the MENA countries using the Systematic Generalized Method of Moments (SGMM) and found a positive relationship between the rule of law and economic growth with financial development. However, the variables of regulatory quality, government budget deficit, government effectiveness, and financial crisis were found to have a negative relationship with financial development.

Bongomin *et al.* (2018) conducted a study that analyzed the relationship between institutional framework and financial inclusion in rural Uganda using a social network perspective and found that institutional framework, as measured by regulatory quality, rule of law, and government effectiveness, had a significant positive effect on financial inclusion in rural Uganda.

Chinoda and Kwenda (2019) conducted a study to investigate the impact of institutional quality and governance on financial inclusion in 49 countries using a two-step system generalized method of moments approach. The study found that institutional quality and governance have a positive impact on financial inclusion in the region. Additionally, the study showed that there is a significant positive effect of the lagged value of financial inclusion and banking sector size on financial inclusion in African countries. However, factors such as rural to total population and natural resources had a negative impact on financial inclusion in Africa.

Atanga and Seabrook (2022) conducted a study to investigate the impact of governance quality on financial development. The authors used a Dynamic Common Correlated Mean group technique to analyze data from a global sample of 120 countries, including 32 high-income and 88 low-income countries. Political stability and absence of violence, rule of law, control of corruption, regulatory quality, government effectiveness, and voice and accountability were used as proxies for governance quality, while financial institutions depth and credit to private sector were used as proxies for financial development. The study found that regulatory quality and political stability and absence of violence had a positive association with financial development, while voice and accountability and government effectiveness had a negative association with it. Additionally, the degree of impact

of these governance indicators on financial development was found to be relatively greater in high-income countries compared to low-income countries.

Alawi *et al.* (2022) investigated the relationship between financial innovation, institutional quality, and financial development in emerging markets. The study used a sample of 17 emerging markets and found that financial innovation and institutional quality had a significant and positive impact on financial development in emerging markets.

Kombo and Koumou (2021) examined the role of the quality of institutions in the financial development of CEMAC countries and found that the quality of regulation and political stability generally reduces the level of financial development in the CEMAC, and on the other hand, the control of corruption and compliance with laws and regulations contribute positively to the CEMAC's financial development.

3. Data and Methods

3.1 Data and Variables

The study was guided by an archival research strategy, where secondary data for Tanzania covering a 31 years period between 1991 and 2022, was collected from World Bank Governance development indicators database, World Bank financial development indicators database, Fraser Institute database, and Bank of Tanzania (BOT) database.

The dependent variable of the study is the banking sector's depth, while the independent variables are control of corruption, rule of law, government effectiveness, and regulatory quality. These variables are measured using the indicators for each institutional quality aspect as shown in Table 1 below.

Table 1: Variable Measurement

Variables	measurements	references
Banking sector financial depth	Credit to private sector% of GDP	Baidoo and Agyapong's (2022), Khan *et al* (2020)
Control of Corruption	Control of Corruption index	Baidoo and Agyapong's (2022) Aluko and Ajayi (2018)
Rule of Law	Rule of Law index	Sanga and Aziakpono's (2022) Aluko and Ajayi (2018)
Government Effectiveness	Government Effectiveness index	Baidoo and Agyapong's (2022) Aluko and Ajayi (2018)
Regulatory Quality	Regulatory Quality index	Sanga and Aziakpono's (2022) Aluko and Ajayi (2018)
Size of the Economy	GDP per capital	Sanga and Aziakpono's (2022

3.2 Model Specifications

In this study, E-Views software version 12 was used for data analysis applying a robust regression model which is an alternative to ordinary least squares (OLS) regression that is less sensitive to outliers and non-normality in the data. To perform robust regression, the study used the M-estimator, which is robust to outliers. The M-estimator minimizes a weighted sum of the residuals, where the weights are functions of the residuals. This technique gives less weight to the outliers in the data, thus making the regression analysis more robust. The robust regression model for this study is specified as follows:

$$FD = \beta_0 + \beta_1 CC + \beta_2 RL + \beta_3 G + \beta_4 RQ + \beta_5 SE + \mu$$

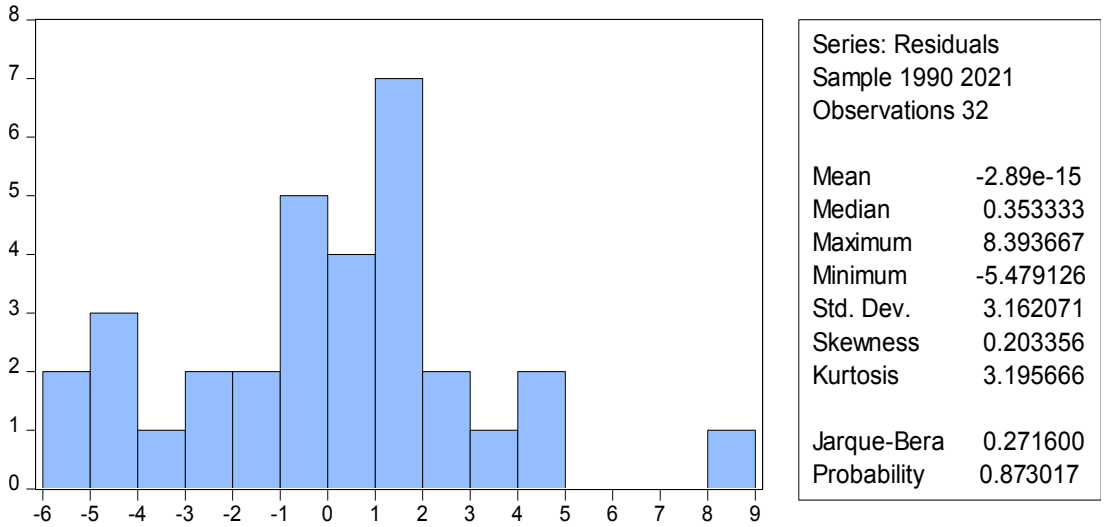
Where; The dependent variable is represented by Financial Depth (FD), while Control of Corruption (CC), Rule of Law (RL), Government Effectiveness (GE), and Regulatory Quality (RQ) are the independent variables, and Size of Economy (SE) stands for control variable. The regression coefficients for these independent variables are denoted by β1, β2, β3, and β4 respectively. The intercept is represented by β0 while control variable is β5 and μ represents the error term.

3.3. Regression Diagnostic Tests

3.3.1. Normality Test

A normality test is a statistical procedure used to determine whether a given dataset followed a normal distribution. The study used the Jarque Bera test to check whether the error terms are normally distributed or not. The Jarque-Bera test is commonly used to check for the normality of data based on the skewness and kurtosis of the dataset. According to the rule of thumb, as recommended by Greene (2018), the null hypothesis about normality of data set is rejected as presented in table 2 below where all variables fall within normally distributed pattern as p-value is observed to be greater than 0.05

Table 2: The Jarque-Bera Test



3.3.2. Heteroscedasticity Test

Heteroscedasticity is a common phenomenon in regression analysis which arises when the variance of the errors in a regression model is not constant across all levels of the predictor variable, Greene, (2018). Heteroscedasticity may lead to biased and inconsistent estimates of the regression coefficients, and it can also affect the validity of results. This study used the Breusch-Pagan-Godfrey test to check whether error variances were constant or not. The Breusch-Pagan test is a chi-square test that compares the sum of squared residuals from a model with a constant variance to the sum of squared residuals from a model with a variable variance. According to the rule of thumb recommended by Gujarati and Porter (2019), the p-value of the Breusch-Pagan-Godfrey test is required to be greater than 0.05 to signify the non-existence of a heteroscedasticity problem. Table 3 shows an F-statistic of 7.9 with a p-value of 0.0001. The table further shows the R-squared value of 19.3% with a corresponding p-value of 0.0017 implying the existence of a heteroscedasticity problem, as guided by Gujarati and Porter, (2019).

Table 3: Breusch-Pagan-Godfrey Test

F-statistic	7.902140	Prob. F (5,26)	0.0001
R-squared	19.29979	Prob. Chi-Square (5)	0.0017

3.3.3. Multicollinearity Test

Multicollinearity is a statistical phenomenon that occurs when two or more predictor variables in a regression model are highly correlated, making it challenging to estimate the unique effect of each variable on the outcome variable, Kutner et al., (2005). As noted by Hair et al (2019), multicollinearity can lead to several issues in regression analysis, including unstable regression coefficients, increased standard errors, decreased statistical power, and reduced overall model fit.

To check for multicollinearity the Variance Inflation Factor (VIF) test was conducted in this paper. The VIF is a statistical measure that assesses the degree of multicollinearity among predictor variables in a regression model. It is calculated as the ratio of the variance of the estimated coefficient of a predictor variable to the variance of that coefficient when the variable is not included in the model (Kutner et al., 2005). The rule of thumb is that explanatory variables are virtually linearly dependent when the coefficient is greater than 10% for the VIF test. As recommended by Lotto (2020), an absolute value of more than 10% is preferable to indicate the existence of multicollinearity for the VIF test.

According to the findings of this study, as shown in Table 4, the VIF values for all variables were well below the threshold of 10%, indicating the absence of multicollinearity among the predictor variables. The centered VIF values ranged from 1.49 to 2.55, which are relatively low and indicate that the variance of each variable is not significantly inflated by the presence of multicollinearity. Overall, the results suggest that there is no evidence of multicollinearity in the regression model, which means that the estimates of the regression coefficients are likely to be stable and reliable, and the model fit is likely to be adequate.

Table 4: Variance Inflation Factor

	Coefficient	Uncentered	Centered
Variable	Variance	VIF	VIF
Control of Corruption	0.006052	16.39853	1.487687
Government Effectiveness	0.143973	68.55962	2.350607
Regulatory Quality	0.028861	72.54949	2.544848
Rule of Law	0.060952	18.11143	1.735192
Size of the Economy	0.179719	14.79858	1.873568
C	11.91600	31.98518	NA

3.3.4. Unit Root Test

A unit root test was used to determine whether a time series variable is stationary or not. Usually, as opposed to non-stationary time series, a stationary time series variable has properties that remain constant over time, often due to trends, seasonality, or other factors as depicted by Hamilton, (1994). To check for a unit root, we used the Augmented Dickey-Fuller (ADF) test. This popular unit root test involves regressing a time series on its lagged values and testing whether the coefficient of the lagged variable is significantly different from 1. A commonly used rule of thumb for interpreting the results of the ADF test is that if the p-value is less than a pre-determined significance level (usually 0.05), the null hypothesis of a unit root is rejected, and the series is considered stationary (Enders, 2014). The findings presented in Table 5 suggest that all variables are stationary at the first difference as evidenced by the t-statistics of less than the critical values at all significance levels. The null hypothesis of a unit root is rejected for all variables at the 1% significance level, indicating that the time series variables are stationary. Therefore, it can be concluded that the data used in this study is stationary after first differencing, which is a necessary assumption for time-series regression analysis.

Table 5: Unit Root Test

Banking sector depth	*t-Statistic*	Prob.*
Test critical values:	-4.09	0.00
1% level	-3.67	
5% level	-2.96	
10% level	-2.62	
1st Difference		
Control of Corruption	*t-Statistic*	Prob.*
Test critical values:	-4.59	0.00
1% level	-3.67	
5% level	-2.96	
10% level	-2.62	
1st Difference		
Government Effectiveness	*t-Statistic*	Prob.*
Test critical values:	-5.26	0.00
1% level	-3.67	
5% level	-2.96	
10% level	-2.62	
1st Difference		
Regulatory Quality	*t-Statistic*	Prob.*
Test critical values:	-4.09	0.00
1% level	-3.67	
5% level	-2.96	
10% level	-2.62	
1st Difference		
Rule of law	t-Statistic	Prob.*
Test critical values:	-4.51	0.00
1% level	-3.67	
5% level	-2.96	
10% level	-2.62	
1st Difference		
Size of the Economy	t-Statistic	Prob.*
Test critical values:	-7.26	0.00
1% level	-3.67	
5% level	-2.96	
10% level	-2.62	

3.3.5. Co-Integration Test

Co-integration is a statistical property of two or more-time series variables that indicate a long-term relationship, Johansen, (1995). To test for cointegration, the study used the Johansen test based on the vector autoregression (VAR) model. The Johansen test uses maximum likelihood estimation to test for the presence of cointegration between two or more-time series variables. The test was based on a system of equations in which the variables were modeled as a linear combination of their past values and a vector of random error term." The Johansen test produced two test statistics: the trace statistic and the eigenvalue statistic. A commonly used rule of thumb for rejecting the null hypothesis of no cointegration based on the Johansen test was that if the p-value is less than a predetermined significance level (usually 0.05), then the null hypothesis is rejected and cointegration was said to be present (Enders, 2014).

The findings of the Johansen Cointegration Test, as per Table 6, indicate that there is evidence of cointegration among the variables included in the study. The trace statistic for each hypothesis is greater than the critical value at the 5% significance level, and the corresponding p-values are less than 0.05, except for the last hypothesis (at most 5). This suggests that there is a long-term relationship among the variables. Specifically, the test results suggest that there are at least four cointegrating equations among the six variables: Banking Sector Depth, Control of Corruption, Government Effectiveness, Regulatory Quality, and Size of the Economy. It is ultimately realized that, the test could not reject the null hypothesis of at most four cointegrating equations.

Table 6: Johansen Cointegration Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.761567	135.0898	95.75366	0.0000
At most 1 *	0.744125	92.07979	69.81889	0.0003
At most 2 *	0.492517	51.18778	47.85613	0.0235
At most 3 *	0.473712	30.83902	29.79707	0.0378
At most 4	0.228018	11.58184	15.49471	0.1781
At most 5	0.119502	3.818023	3.841466	0.0507

4. Empirical Results

4.1 Descriptive Analysis

The findings presented in Table 7 indicate that Banking Sector Depth exhibits the mean value of 9.74, with a range between the maximum value of 14.61 and the minimum value of 2.94. This suggests a considerable variation in the depth of the banking sector. The distribution appears to be slightly left-skewed, as indicated by the skewness value of -0.59, and somewhat flatter compared to a normal distribution, with a kurtosis value of 1.85. The Jarque-Bera test returns a p-value of 0.16, which implies no significant deviation from normality.

In regards to Control of Corruption, the mean value is 30.30, with a maximum of 48.29 and a minimum of 11.75. This demonstrates a wide range of corruption control levels. The distribution is approximately symmetrical, as indicated by the skewness value of 0.02. The kurtosis value of 2.17 suggests a distribution shape similar to a normal distribution. The Jarque-Bera test yields a p-value of 0.63, indicating no significant deviation from normality. In terms of Government Effectiveness, the mean value is 26.07, with a maximum of 41.75 and a minimum of 11.58, indicating variation in the effectiveness of the government. The distribution is marginally right-skewed, with a skewness value of 0.17. The kurtosis value of 1.92 suggests a slightly flatter distribution than a normal distribution. The Jarque-Bera test returns a p-value of 0.43, implying no significant deviation from normality.

For Regulatory Quality, the mean value is 30.06, with a maximum of 39.81 and a minimum of 18.11. The skewness value of -0.12 indicates a near-symmetrical distribution, while the kurtosis value of 2.21 implies a distribution shape close to a normal distribution. The Jarque-Bera test yields a p-value of 0.64, suggesting no significant deviation from normality.

When examining Rule of Law, the mean value of 32.74 is exhibited with a maximum of 44.50 and a minimum of 18.62. The distribution is slightly left-skewed, as indicated by the skewness value of -0.19, and flatter compared to a normal distribution, with a kurtosis value of 1.57. The Jarque-Bera test returns a p-value of 0.23 which indicates no significant deviation from normality.

Finally, for the Size of the Economy variable (GDP), the mean value is 5.18, with a maximum of 7.67 and a minimum of 0.58. The distribution is left-skewed, with a skewness value of -0.81, and exhibits a kurtosis value of 2.58, which is somewhat flatter than a normal distribution. The Jarque-Bera test yields a p-value of 0.16, suggesting no significant deviation from normality.

Table 7: Descriptive Results

	Banking Sector Depth	Control of Corruption	Government Effectiveness	Regulatory Quality	Rule of Law	Size of economy
Mean	9.74	30.30	26.07	30.06	32.74	5.18
Median	11.37	28.50	26.72	29.26	33.65	5.74
Maximum	14.61	48.29	41.75	39.81	44.50	7.67
Minimum	2.94	11.75	11.58	18.11	18.62	0.58
Std. Dev.	3.96	9.72	9.04	5.82	8.60	2.00
Skewness	-0.59	0.02	0.17	-0.12	-0.19	-0.81
Kurtosis	1.85	2.17	1.92	2.21	1.57	2.58
Jarque-Bera	3.66	0.93	1.70	0.90	2.91	3.70
Probability	0.16	0.63	0.43	0.64	0.23	0.16
Observations	32	32	32	32	32	32

4.2 Regressions Analysis

Generally, the study was conducted to examine the influence of the institutional quality on the banking sector financial depth in Tanzania. The results were analysed through the lens of institutional quality theory which postulates that the quality of a country's institutions significantly affects its economic performance and development. The results support the institutional quality theory, highlighting the importance of various institutional factors in shaping the banking sector's financial depth.

The results presented in Table 8 show an adjusted R-squared value of 0.344 suggesting that approximately 34% of the variation in banking sector financial depth can be explained by the combined influence of the control of corruption, government effectiveness, regulatory quality, and rule of law, along with the size of the economy as a control variable. The adjusted value accounts for the number of predictors in the model and the sample size, and it implies that, after taking these factors into consideration, approximately 34% of the variation in banking sector financial depth can be explained by the aforementioned variables. Furthermore, the Rn-squared statistic of 70% and the associated probability of 0.00, suggests that the model is statistically significant sending a message that the control of corruption, government effectiveness, regulatory quality, and rule of law, along with the size of the economy as a control variable, have a significant influence on the banking sector financial depth in Tanzania.

Regarding control of corruption, the regression results, in table 8, reveal a statistically significant positive relationship between banking sector depth and Control of Corruption with significance level of 5% and a coefficient of 0.19. This suggests that as corruption control improves, the banking sector depth also increases by 19%, and therefore, addressing corruption is essential for promoting a healthy and robust banking sector. The positive influence of control of corruption supports the idea that reducing corruption leads to a more stable and secure environment for the banking sector. This aligns with the institutional quality theory, which emphasizes the importance of transparent and accountable institutions in promoting economic growth and development.

Several factors could contribute to these findings. For instance, improved control of corruption can lead to a more transparent and accountable regulatory environment, which in turn fosters greater confidence in the banking sector. This, consequently, may result in increased investments, better access to financial services, and enhanced competition among financial institutions. Additionally, effective control of corruption can reduce the likelihood of fraud and financial malpractices within the banking sector. By minimizing corruption-related risks, banks can operate more efficiently, and focus on providing a wider range of services to their customers. This may lead to the overall growth and development of the banking sector. Furthermore, the reduction of corruption can improve the overall business environment, leading to increased economic stability and growth. This can positively influence the banking sector by providing more opportunities for lending and investment, ultimately contributing to a deeper

and more diversified banking sector. The results are consistent with Bermpei *et al,* (2018) who concludes that control of corruption enhances the positive effect of activities restrictions on stability

As to the influence of government effectiveness on the banking sector financial depth table 8 presents a coefficient of -0.365381, and the p-value is 0.0207 which is less than 0.05, a threshold for accepting or rejecting a null hypothesis. Based on these statistics the null hypothesis is rejected showing that there is no influence of Government Effectiveness on the banking sector financial depth in Tanzania.

More specifically, the results show that government effectiveness hamper the banking sector depth by 36.5%. The findings, further, imply that lack of government effectiveness negatively impacts the banking sector depth in Tanzania. Explicitly, when government effectiveness is low, the banking sector depth decreases by 36.5%. This suggests that the presence and implementation of effective government policies are essential for a thriving banking sector. The reported negative influence of government effectiveness on the banking sector's financial depth underscores the need for improvements in governance structures and public service delivery in Tanzania. According to the institutional quality theory, efficient and well-functioning government institutions are crucial for fostering economic development. The findings suggest that enhancing government effectiveness in areas affecting the banking sector could help improve the sector's financial depth and contribute to Tanzania's overall economic growth.

Several factors may be associated with these findings; f*irst,* ineffective government policies or a lack of policy enforcement might result in a weak regulatory environment, which may hinder the banking sector's growth and development. *Second,* inadequate oversight of the banking sector could lead to insufficient competition, limited access to financial services, and increased risk of fraud or financial instability. *Third,* a lack of government effectiveness may also create an uncertain economic environment, which may reduce investor confidence and discourage investment in the banking sector.

When it comes to impact of Rule of Law on Banking Sector Financial Depth. Table 8 returns a coefficient of 0.443 for the variable, rule of law, and the p-value of 0.017, which is less than 0.05, implying that as the rule of law improves, the banking sector depth increases by 44.3%. Thus, the study rejects the null hypothesis that there is no influence of the Rule of Law on the banking sector financial depth in Tanzania. The results imply that there is a positive relationship between the rule of law and banking sector depth in Tanzania.The positive influence of the rule of law on the banking sector's financial depth highlights the importance of strong legal and regulatory frameworks for the sector's performance as advocated by institutional quality theory on the role of a robust legal system in promoting economic development by ensuring property rights protection, fair dispute resolution, and contract enforcement.

The results of this study suggest that a strong legal framework is essential for promoting a healthy and robust banking sector. Some factors could be attributed to these findings. Meanwhile, a strong rule of law can provide a stable and predictable legal environment that is conducive to the growth and development of the banking sector. When there is confidence in the legal system, businesses and individuals are more likely to engage with financial institutions, resulting in increased demand for banking services, higher levels of competition, and a deeper banking sector. Additionally, an effective rule of law can help ensure that contracts and property rights are enforced, which is crucial for the functioning of a healthy banking sector. This can encourage lending, as banks can trust that loans will be repaid and that their interests will be protected by the legal system. Furthermore, a strong rule of law can enhance the overall business environment, attracting both domestic and foreign investments to the banking sector. Moreover, a well-functioning legal system can provide effective dispute resolution mechanisms, which can help maintain trust and confidence in the banking sector. This can contribute to the overall stability of the financial system, reducing the likelihood of financial crises and promoting long-term growth.

Table 8 also reports the influence of the Regulatory Quality on Banking Sector Financial Depth. The analysis returns a coefficient of 0.432893 and a p-value of 0.0007, which is less than 0.05 implying that as regulatory quality improves, the banking sector depth increases by 43.3%. Consequently, the study rejects the null hypothesis that there is no influence of Regulatory Quality on the banking sector financial depth. The findings imply that

there is a statistically significant positive relationship at 1% significant level between regulatory quality and banking sector depth. Specifically, when regulatory quality improves, the banking sector depth increases by 43.3%. This suggests that an effective regulatory environment is essential for promoting a healthy and robust banking sector. These findings may be associated with the following factors; *First*, improved regulatory quality can lead to a more transparent, accountable, and stable financial environment that fosters confidence in the banking sector. This can ultimately result in increased investments, better access to financial services, and enhanced competition among financial institutions. Also, effective regulation can as well help mitigate risks associated with the banking sector, such as credit, liquidity, and operational risks. By ensuring that banks adhere to prudential standards and risk management practices, regulatory authorities can contribute to the overall stability and resilience of the financial system which may, in turn, create a more conducive environment for the growth and development of the banking sector. *Second*, relatively high regulatory quality may promote innovation within the banking sector by providing a clear and supportive framework for the development and implementation of new financial products and services. This can lead to a more diversified and dynamic banking sector that is better able to meet the needs of consumers and businesses. *Finally*, effective regulation can help prevent financial malpractices, such as fraud or money laundering, which can undermine trust in the banking sector. All these factors altogether, highly improve banking sector financial depth.

Finally, the findings presented in table 8 indicate a negative relationship between the size of the economy, measured by GDP per capita, and banking sector depth, with the coefficient of -0.988390 and the p-value being 0.0020. The findings imply that there is a statistically significant negative relationship at 1% significant level between size of the economy and banking sector depth. This suggests that the slow growth of GDP per capita is not sufficient to support the banking sector depth leading to a decrease of 98.8%. Several factors could contribute to this situation. *Firstly*, the slow growth of GDP per capita might not generate enough demand for financial services, limiting the expansion of the banking sector. *Secondly*, a large informal economy, often associated with slow-growing economies, could reduce the share of the formal banking sector. *Lastly*, inefficient allocation of resources within the economy might not direct enough resources towards the development of the banking sector, further exacerbating the negative impact of slow GDP per capita growth on banking sector depth.

Table 8: Regression Results

Variable	Coefficient	Std. Error	z-Statistic	Prob.
Control of Corruption	0.193157	0.058604	3.295954	0.0010
Government Effectiveness	-0.365381	0.157965	-2.313046	0.0207
Regulatory Quality	0.432893	0.127974	3.382656	0.0007
Rule of Law	0.442585	0.185979	2.379766	0.0173
Size of the Economy	-0.988390	0.319348	-3.095021	0.0020
C	-9.709432	2.600354	-3.733889	0.0002
	Robust Statistics			
R-squared	0.448428	Adjusted R-squared		0.342357
Rw-squared	0.765175	Adjust Rw-squared		0.765175
Akaike info criterion	57.15741	Schwarz criterion		66.97152
Deviance	160.2019	Scale		1.862604
Rn-squared statistic	70.19590	Prob (Rn-squared stat.)		0.000000
	Non-robust Statistics			
Mean dependent var	9.738115	S.D. dependent var		3.957733
S.E. of regression	4.308386	Sum squared resid		482.6169

5. A Concluding Remark

This paper mainly aimed at examining the influence of institutional quality on the banking sector's financial depth in Tanzania. The paper has provided valuable insights into the relationship between institutional quality and the financial depth of the banking sector in Tanzania. The findings reveal that control of corruption and rule of law positively influence the banking sector's financial depth, while government effectiveness has a negative impact. Moreover, regulatory quality also contributes positively to the financial depth of the banking sector. These results emphasize the importance of maintaining a strong institutional framework, combating corruption, and ensuring effective regulation in order to promote a more resilient and robust banking sector in Tanzania. The paper

encourages the Government of Tanzania to ensure a transparent and corruption-free environment, which ultimately fosters growth in the banking sector.

More specifically, the paper recommends the government of Tanzania, in collaboration with the PCCB, to focus on enhancing anti-corruption efforts, as control of corruption has a positive impact on the banking sector's financial depth. By adopting international anti-corruption conventions, strengthening the capacity of the PCCB to investigate and prosecute corruption cases, and promoting transparency and accountability in both the public and private sectors, a more conducive environment for the growth of the banking sector can be created.

Regarding the government effectiveness, the paper suggests striking a careful balance between allowing the market to function efficiently and government intervention. This may involve re-evaluating the government's role in the banking sector and identifying areas where intervention can be reduced to encourage market-driven growth. So as to improve banking sector performance, the government should enhance inter-agency coordination, streamlining decision-making processes, and improving public service delivery in areas affecting the banking sector.

Regarding rule of law, the paper insists the government to focus on creating and enforcing clear and consistent regulations that foster a competitive and efficient banking sector while mitigating risks to financial stability. Furthermore, the paper recommends emphasis to be placed on promoting fair and impartial dispute resolution, protecting property rights, and enforcing contracts. By strengthening the judicial system and improving law enforcement, a stable environment for the banking sector to flourish can be fostered. Providing training and resources to judges and law enforcement officers can ensure the consistent application of laws and regulations.

Finally, as regard to regulatory quality policymakers should insist on effective implementation of risk-based supervision frameworks which are apparently adopted in Tanzania, enhancing reporting standards, and fostering cooperation between regulatory authorities, such as the Bank of Tanzania and the Ministry of Finance, to ensure a comprehensive approach to regulation.Some further studies should focus on sub-sector analysis such as commercial banks, micro finance institutions, and non-banking financial institutions. Future studies could also investigate the influence of institutional quality on the financial depth of these different sub-sectors, as their respective roles and responses to institutional quality may vary.

Funding: Not applicable.

Conflict of Interest: The authors declare no conflict of interest.

Informed Consent Statement/Ethics Approval: Not applicable.

References

Acemoglu, D., & Robinson, J. A. (2012). Why Nations Fail: The Origins of Power, Prosperity, and Poverty. *Crown Business*.

Alawi, S. M., Abbassi, W., Saqib, R., & Sharif, M. (2022). Impact of financial innovation and institutional quality on financial development in emerging markets. *Journal of risk and financial management, 15(3), 115.*

Aluko, O.A. and Ibrahim, M. (2020). Institutions and the financial development–economic growth nexus in sub-Saharan Africa. *Economics Notes, Vol. 49(3), 1-16*.

Atanga Ondoa, H., & Seabrook, A. M. (2022). Governance and financial development: Evidence from a global sample of 120 countries. *International Journal of Finance & Economics, 27(3), 3405-3420.*

Bank of Tanzania. (2023). Monetary Policy Committee meeting statement, *https://www.bot.go.tz/News/MPC_Statement/MPC_Statement_30th_January_2023.pdf*

Blancher, N., Appendino, M., Bibolov, A., Fouejieu, A., Li, J., Ndoye, A., Panagiotakopoulou, A., Shi, W., & Sydorenko, T. (2019). Financial Inclusion of Small and Medium-Sized Enterprises in the Middle East and Central Asia. *IMF Departmental Paper 19/02. International Monetary Fund.*

Bongomin, G. O. C., Munene, J. C., Ntayi, J. M., & Malinga, C. A. (2018a).

Analyzing the relationship between institutional framework and financial inclusion in rural Uganda: A social network perspective. *International Journal of Emerging Markets, 13(4), 827-847.*

Bongomin, G. O. C., Munene, J. C., Ntayi, J. M., & Malinga, C. A. (2018b).

Analyzing the relationship between institutional framework and financial inclusion in rural Uganda: A social network perspective. *International Journal of Emerging Markets, 13(4), 827-847.*

Enders, W. (2014). Applied econometric time series (4th ed.). *John Wiley & Sons.*

Fagbemi, F., & Ajibike, J. O. (2018). Institutional quality and financial sector development: Empirical evidence from Nigeria. *American Journal of Business and Management, 7(1), 1-13.*

Greene, W. H. (2018). Econometric analysis (8th ed.). *Pearson.*

Gujarati, D. N., & Porter, D. C. (2019). Basic econometrics (6th ed.). *McGraw-Hill Education.*

Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2019). Multivariate data analysis (8th ed.). *Cengage Learning*.

Hamilton, J. D. (1994). Time series analysis (Vol. 2). *Princeton University Press.*

Kaufmann, D., Kraay, A., & Mastruzzi, M. (2010). The Worldwide Governance Indicators: Methodology and analytical issues. *World Bank Policy Research Working Paper No. 5430.*

Kebede, J., Selvanathan, S., & Naranpanawa, A. (2021). Foreign bank presence, institutional quality, and financial inclusion*: Evidence from Africa. Economic Modelling, 102, 1-15.*

Khan, H., Khan, S., & Zuojun, F. (2020a). Institutional quality and financial development: Evidence from developing and emerging economies. *Global Business Review. https://doi.org/10.1177/0972150919892366*

Khan, M. A., Kong, D., Xiang, J., & Zhang, J. (2020b). Impact of institutional quality on financial development: Cross-country evidence based on emerging and growth-leading economies. *Emerging Markets Finance and Trade, 56(15), 3829-3845.*

Kombo, P. G. B. N., & Koumou, G. B. (2021). The role of the quality of institutions in the financial development of CEMAC countries. *Modern Economy, 12(2), 452-468.*

Kutner, M. H., Nachtsheim, C. J., Neter, J., & Li, W. (2005). Applied linear statistical models (5th ed.). *McGraw-Hill/Irwin.*

Kwenda, F., & Chinoda, T. (2019). The impact of institutional quality and governance on financial inclusion in Africa: A two-step system generalized method of moments approach. *Journal of Economic and Financial Sciences, 12(1), 1-9.*

Lotto, J. (2020). Towards extending dividend puzzle debate: What motivates distribution of corporate earnings in Tanzania? *International Journal Financial Studies, 8(1), 1-14.*

Mauro, P. (1995). Corruption and growth. *Quarterly Journal of Economics, 110(3), 681-712.*

North, D. C. (1990). Institutions, institutional change and economic performance. *Cambridge University Press.raga*

Ntow-Gyamfi, M., Bokpin, G. A., Aboagye, A. Q., & Ackah, C. G. (2019). Financial development, institutional quality and inclusive growth in Africa. Global Business Review, December. https://doi.org/10.1177/0972150919875367

Sanga, B., & Aziakpono, M. (2022). The effect of institutional factors on financial deepening: Evidence from 50 African countries*. Journal of Business and Socio-economic Development, vol 4(3), 12-34*

Sarhangi, K., Niya, M., Javad, M., Amiri, M., Sargolzaei, M., Sarvolia, E., & Hassan, M. (2021). The impact of effective governance and regulatory quality on financial development under economic conditions of the MENA countries. *sitiens*

Sitienei, I. (2022). Bridging the great finance divide in developing countries. *Brookings. https://www.brookings.edu/blog/future-development/2022/06/08/bridging-the-great-finance-divide-in-developing-countries/*

Vera Martin, M., Jardak, T., Tchaidze, R., Trevino, J., & Wagner, H. W. (2018). Building resilient banking sectors in the Caucasus and Central Asia. *IMF Departmental Paper 18/08. International Monetary Fund.*

World Bank. (2019). Governance Matters 2018: *Worldwide Governance Indicators 1996-2018. Retrieved from https://info.worldbank.org/governance/wgi/*

The Asian Institute of Research
Economics and Business Quarterly Reviews
Vol.7, No.1, 2024: 41-54
ISSN 2775-9237

DOI: 10.31014/aior.1992.07.01.558

Revolutionizing Healthcare Finances: Navigating the Impact of Innovative Technologies on Medical Claims Cost Containment in the MENA Region

Wissam Mattout[1], Figen Yesilada[2]

[1] Department of Business Administration, Cyprus International University, Nicosia, North Cyprus, Turkey.
E-mail: Wissam@WissamMattout.com
[2] Department of Business Administration, Cyprus International University, Nicosia, North Cyprus, Turkey.
E-mail: fyesilada@ciu.edu.tr ORCID ID: 0000-0002-1407-9915

Correspondence: Wissam Mattout. Email: Wissam@WissamMattout.com

Abstract
Countries are actively developing more effective ways and policies to tackle the high costs associated with healthcare. The advancement in medical technology has received praise for enhancing the healthcare system. However, it has also been criticized for contributing to a surge in medical costs, which is one of the impending challenges faced by the healthcare system today. To sustain the utilization of innovative techniques and medication, pharmaceutical companies must embrace more sophisticated technologies, which may ultimately be passed on to patients. This encourages people to contact as many health insurance providers as possible. Therefore, the objective of this study is to examine the healthcare insurance systems and measures for controlling costs used by insurance firms. The study has gathered cross-sectional data by employing a semi-structured interview method. The participants in the study are thirty-five insurance professionals who possess significant expertise in their various positions. Four themes emerged from the study questions that were posed. Research has revealed that while innovative technology may be cost-effective, these technologies are also more sensitive and necessitate the expertise of technical specialists and professionals for their operation, ultimately leading to higher costs.

Keywords: Innovative Technology, Medical Claims, Cost Containment, Insurance Companies, MENA, Accessible Health System

1. Introduction

Many countries are working on forming better strategies and policies to address the high costs of healthcare. Several countries particularly in Europe have been exploring methods for cost containment by implementing strategies throughout the fiscal crisis. Furthermore; some other countries like France, Ireland, and Greece have also taken various actions to reduce the costs of visiting a doctor by reducing fees by 25%. Several cost containment techniques have been implemented to address various aspects of the healthcare system, including

market procedures, prices, demand, and supply. Nevertheless, the complex structure of the healthcare system hinders the accomplishment of objectives aimed at controlling costs. Price reductions can potentially lead to an increase in volume in other areas, as demonstrated by (Stadhouders et al., 2016). The advances in medical technology have been praised for enhancing the healthcare system. However, it has also been criticized for causing increased medical costs, which has contributed to some of the current challenges faced by the healthcare system. While modern medical equipment and technology may have a lower cost per unit compared to the technologies they replace, they are sensitive to specific techniques and require specialized training and specialists to operate them. Consequently, this leads to higher overall costs. Research has demonstrated that decreasing costs will enhance operational efficiency and, in turn, lower the costs incurred by customers (Agustina et al., 2019). Yet, it will have an adverse influence on the advancement of research and development in the field of effective and life-saving medical treatment.

Moreover, for the continued adoption of innovative methodologies and medications, pharmaceutical firms need to incorporate advanced technologies, which consequently shift the financial responsibility onto consumers. As a consequence, individuals are compelled to engage with multiple health insurance providers. Historically, various benefits and incentives were employed to acquire innovative and secure medical technologies beneficial for patients (Özdemir, and Hekim, 2018). This underscores the commitment of healthcare service providers to delivering enhanced patient care, addressing concerns about potential medical errors, fostering a technologically-oriented environment, and relying on a supportive third-party reimbursement system, wherein medical insurance companies play a pivotal role (Vatandsoost, and Litkouhi, 2019).

The implementation of the Medical Care Prospective Payment System (PPS) and other cost containment strategies has been initiated to restrict costs in the healthcare industry. Technological advancements in healthcare have not only improved overall health but also increased life expectancy and facilitated easier and quicker access to medical services (Ekelman, 1988).

Insurance companies, hospitals, and patients are motivated to embrace cost-saving technologies. There has been a lack of extensive research conducted to investigate the involvement of third parties, such as insurance firms, in implementing cost-containment strategies and innovative technologies in the MENA region. This study assesses the role of insurance companies in implementing cost-containment strategies and examines how hospitals, doctors, physicians, and patients might incorporate cost-effective technologies. This will provide clarification on medical expense claims and the involvement of insurance companies in technology purchases.

This research particularly aims to investigate and evaluate the influence of innovative technology on medical claims cost containment strategies in the Middle East and North Africa (MENA) region. The study further aims to investigate how emerging technological advancements impact the efficiency and productivity of healthcare cost management and to enhance our comprehension of the financial sustainability of healthcare in this particular region.

2. Literature Review

Mehta and Pandit (2018) state that technology plays a significant role in shaping the future of medical strategies in hospitals. Projections suggest that the digital health industry is expected to achieve an estimated value of 38 billion by the year 2025. According to Stratview Research (2021), the global allocation for digital health in 2020 reached a significant sum of $13.9 billion. This noteworthy information illustrates the healthcare industry's robust tendency to employ digital technologies in medical practices. Moreover, the countries in the MENA Region face significant financial challenges and lack the required funds to accommodate patients in hospitals. Consequently, the advanced technology employed in the hospitals of the MENA countries are prohibitively costly, leading to a detrimental impact on the overall expenses associated with patient admissions.

On the other hand, the introduction of advanced medical technologies leads to a substantial increase in overall costs for patients admitted to hospitals. The use of innovative technologies facilitates rapid and efficient patient

diagnosis, as well as effective treatment of different health problems. In addition, Yaqoob et al. (2022) assert that the viability of emerging technologies in the MEA countries depends on the overall costs imposed on patients. There is an urgent need for the development of innovative technologies to enhance the overall healthcare status of patients. It is essential to understand the entire influence of the latest developments in innovative medical technologies on patient care in the MEA region.

Medical claims cost containment is a crucial concern in healthcare systems globally, and various countries have used diverse solutions to tackle this issue (Atun et al., 2015; Martin et al., 2018; Agustina et al., 2019). Commonly employed strategies include encouraging the practice of preventative care, implementation of cost-sharing plans, utilization of technology, and negotiation of prices with healthcare providers.

Insurance companies in the United States have adopted cost containment strategies, including the use of management programs to evaluate the necessity and suitability of medical procedures, as well as disease management programs that focus on preventive care and the management of chronic diseases (Mulcahy et al., 2018). In addition, the US government has enacted the Affordable Care Act (ACA) to offer affordable health insurance to its citizens and encourage preventative healthcare.

Several European governments have adopted cost-containment strategies, including the promotion of generic medications, the use of technology, and price negotiations with healthcare providers (Blocher et al., 2019). For example, Germany has introduced the "reference price system," which limits the prices of medicines to the average price of comparable medicines in other European nations.

Asian countries like Japan and Singapore have adopted cost containment initiatives, including the promotion of preventative care, price negotiation with healthcare providers, and the implementation of cost-sharing plans (Chen et al., 2021).

A study conducted in Canada revealed that the implementation of telemedicine services in remote areas could lead to a reduction in healthcare costs and improve patient outcomes (Morse et al., 2019). Another study conducted in Europe showed that the adoption of the reference price system might substantially decrease medication costs (Levin et al., 2020).

2.2 Strategies used for cost containment in the healthcare industry

Cost containment strategies are employed in the healthcare industry to decrease total healthcare expenditure and enhance cost-effectiveness (Burns and Pauly, 2018). These strategies include a range of actions, including minimizing unnecessary medical procedures, establishing cost-sharing initiatives, advocating for preventive care, and utilizing technology to enhance efficiency.

Insurance companies play a significant role in cost containment by adopting new strategies and approaches that encourage healthcare providers to deliver quality care while limiting costs (Mossialos and Le Grand, 2019). Insurance companies can engage in negotiations with healthcare providers to establish more affordable prices for medical services, thus contributing to the reduction of the overall cost of healthcare. Additionally, insurance companies can employ cost-sharing mechanisms like co-payments and deductibles. These mechanisms can encourage consumers to choose more affordable treatments and prevent unnecessary medical procedures (Hansen et al., 2021). Insurance companies can further promote preventive care by offering incentives for routine check-ups, vaccinations, and health-conscious behaviors.

Innovative technology can also have a significant effect on initiatives aimed at controlling costs. Electronic health records (EHRs) have the potential to optimize healthcare professionals' methods and minimize administrative costs (Groves et al., 2016). Telemedicine can additionally reduce healthcare costs by facilitating patients to receive remote consultations and reducing the necessity for costly hospital visits. Hence, it is imperative to investigate the

influence of innovative technology on cost-containment strategies in the MENA region, as it has the potential to provide novel solutions for healthcare cost management while improving patient outcomes.

2.3 Strategies for cutting hospital expenditures via technological innovation

Zeadally and Bello (2021) argue that it is imperative to reduce healthcare costs to deliver appropriate medical care to patients in hospitals. Crucially, it is important to establish a fair pricing mechanism to ensure the provision of extensive medical care for patients. On the other hand, it is essential to offer comprehensive healthcare services to patients at a reduced cost to improve the relationship with the patients admitted to the hospitals.

The decline in healthcare practices serves as a symbolic representation of an efficient healthcare system, contributing to the rapid recuperation of patients in subsequent periods. Hospitals are compelled to adapt by formulating effective cost-reduction strategies facilitated by the integration of advanced technologies, aiming to enhance patient care.

Furthermore, Bekfani et al. (2021) assert that it is necessary to fully sequence the fundamental methods and technologies employed in hospitals for patient treatment. It helps in the analysis and identification of system shortcomings and provides better alternatives for the technology utilized in healthcare systems. This is done to optimize the use of low-cost and effective medical technology to meet the individual needs of patients. It enhances the overall health condition and reduces the cost of the technology employed in treating patients.

2.4 Healthcare System's Reaction to price-innovation Schemes

According to Price et al., (2021), there has been a substantial decrease in health care expenses implemented by hospitals. It has facilitated the establishment of a long-term relationship with patients and hospital administration in Middle Eastern countries. On the other hand, introducing price-reduction strategies has also diminished the quality of healthcare services provided to patients. The administration of hospitals has experienced a significant decline in preserving the quality of innovative technologies used for patient treatment.

Chen et al. **(**2021) stated that implementing a fixed payment system has turned out to help increase awareness among physicians. This facilitates the provision of improved healthcare services to patients at an affordable price. However, the MENA region has experienced a significant decline in living conditions. Consequently, hospital administrations are forced to carry out comprehensive cost-reduction initiatives to ensure adequate and cost-effective treatment for patients.

2.5 Insurance companies and their role in cost containment

Insurance companies play a vital role in cost containment in the healthcare sector (Mossialos and Le Grand, 2019). They can engage in negotiations with healthcare providers to establish more affordable prices for medical services which consequently can contribute to the reduction of the overall cost of healthcare (Denis and van Gestel, 2016). Insurance companies can make agreements with healthcare providers, requiring that the providers offer medical services at reduced prices. Insurance companies can also establish networks of healthcare providers who are willing to offer medical services at lower costs to patients on the insurance plan (Denis and van Gestel, 2016). Implementing such strategies may successfully reduce the costs associated with medical services and offer affordable healthcare alternatives to the insured population.

Additionally, insurance companies can implement cost-sharing mechanisms such as co-payments and deductibles, which may serve as incentives for patients to opt for more cost-efficient treatments and to avoid unnecessary medical procedures (Barua and Moir, 2022). Insurance plans may require patients to pay a percentage of the cost of medical procedures, which may encourage patients to choose less expensive treatment alternatives. Insurance companies might further encourage preventative care by offering incentives for routine check-ups, vaccines, and

adopting healthy lifestyles (Yao et al., 2015). By providing incentives for preventive care, insurance companies can effectively decrease the occurrence of expensive chronic illnesses and enhance general health outcomes. Furthermore, insurance companies might employ technology to improve cost efficiency and reduce administrative costs. Electronic Health Records (EHRs) can help healthcare providers streamline their workflows and reduce administrative costs, which can ultimately result in lower healthcare expenditures (de la Vega et al., 2019).

2.6 Changes in healthcare technology due to efforts to save costs

According to Gu and Shen (2020), patients' cost-reducing efforts have had a significant impact on healthcare system innovation. This has resulted in a decline in the overall quality of care provided to patients in healthcare institutions.

Lo et al. (2021) state that the cost attainment strategies impact the overall innovation of the technology such as the use of high-standard medical equipment and the provision of better health care for the patients admitted to the hospitals. Furthermore, in the adoption of non-standardized, unconventional, and cost-effective treatment methods for patients.

Moreover, it influences the establishment of a long-term relationship with patients and enhances the overall quality of the institution.

Furthermore, it is important to maintain and improve the quality standard of healthcare technology to ensure the fast recovery of patients in hospitals. Evidence suggests that the people of Middle Eastern countries suffer from poverty and inadequate access to healthcare services. Ensuring high-quality healthcare is crucial for establishing and sustaining long-term patient relationships.

3. Materials and Methods

The research methodology employed in this study focused on the collecting of qualitative data, which is a methodical approach that is well-suited for extracting valuable insights. One-to-one semi-structured interviews were made with 34 insurance industry professionals who have sufficient experience in their respective roles identified using purposive sampling.

3.1 Guiding Questions

The guiding questions were:
How can you explain the most effective strategies for medical claims costs? How do you evaluate an increase in medical costs associated with technology as a result of patient's demand for new technologies? How do insurance companies, hospitals and healthcare providers deal with medical cost claims? How do Medical Insurance Companies adopt/use innovative technology to improve efficiency while reducing medical claims costs? What kind of possible contributions medical insurance companies would provide through big data analysis? How medical insurance companies should adapt the developments in Big Data to this sector? How do you evaluate the price innovation strategies on the healthcare system of the hospitals that will be beneficial especially for MENA Region? How do you evaluate the influence of innovative technologies as a tool containing the cost of medical claims? How do innovative technologies lower the demand for other types of medical services, which causes the overall cost of medical care to reduce? How innovative technology can bring positive or negative impact on medical claims costs and health trends? What should constitute planning for the adoption of innovative technology in MENA Region? What challenges do you see with the realization of innovative technology regarding cost containment strategies? As far as innovative technology is concerned, are there any other issues you would like to point out regarding cost containment strategies by insurance companies, hospitals, and healthcare providers in the MENA region?

The interviews conducted in this study facilitated participants in openly expressing their thoughts, promoting an atmosphere of open communication. The adaptable format of these interviews enabled a natural investigation of relevant topics, ensuring that the conversation remained on track. This method not only enhanced comprehension of the participants' viewpoints but also fostered mutual investigation between the interviewer and respondent. These interviews are an ideal method for gathering informative and detailed perspectives from the participants by promoting open communication, flexibility, and shared investigation.

Ethical considerations were taken into account to guarantee that the research would provide reliable results (Akaranga, and Makau, 2016). All participants who took part in the research gave their verbal consent during the interview. Upon being approached by the researcher, all subjects willingly agreed to participate in the study. Before commencing the interview, every query posed by each participant was addressed by providing a clear explanation of the study's aims and objectives. In a similar vein, the participants were given the option to leave the interview at any time while it was being conducted (Harriss et al., 2019). Similarly, the participants were provided with the opportunity to withdraw from the interview at any point during its execution (Harriss et al., 2019). Furthermore, before recording the interview, the participants were formally asked for their consent. Furthermore, the participants were explicitly informed that their personal information would be maintained in absolute confidentiality.

The data collected from the interviews was analyzed using a thematic approach. Thematic analysis is widely employed as a method of data analysis due to its ability to facilitate understanding of information gathered from interviews (Clarke, et al., 2015). In addition, the researcher can categorize relevant themes and subthemes that can be utilized while analyzing the collected data (Terry et al., 2017). Furthermore, the initial codes were developed to assess and understand the content of the studies. Subsequently, preliminary themes were established to better understand the background of the research. Similarly, all the themes were reviewed with a thorough examination to ensure precise interpretation and representation of the data.

4. Findings

Out of 34 respondents from 11 different Mena countries, 13 were medical doctors, 12 were executive managers and 9 were chief officers. More than half of the respondents had 20 and higher years of work experience (Appendix 1).

4.1 Content analysis results

Content analysis revealed four major themes: The role of insurance companies on medical cost claims, Innovative technologies for Insurance companies, Innovative Technologies for Cost Containment, and Challenges Insurance Companies face in MENA Region.

4.1.1 Theme 1 - Role of Insurance Companies on Medical Cost Claims

Table 1: Role of Insurance Companies on Medical Cost Claims (Theme 1)

Meaning Units	Condensed Meaning Units	Sub-Themes	Theme
Effective claim management is essential for cost containment	Claim management is key to cost containment	Claim Management	Role of Insurance Companies on Medical Cost Claims
Self-funding and third-party payers can reduce costs	Self-funding and third-party payers lower costs	Self-funding and Third-party Payer	
Advancements in medical technology have reduced costs	Tech advancements lower medical costs	Innovative Technologies	
Innovative technologies like telemedicine can reshape treatment	Telemedicine can reshape treatment		

Insurance companies use pay-for-healthcare to control costs	Pay-for-healthcare controls costs	Healthcare Affordability	
Insurance companies make healthcare affordable for people	Insurance makes healthcare affordable		

Four sub-themes leading to Theme 1 "Role of Insurance Companies on Medical Cost Claims" emerged as a result of the first question asked to the respondents. Respondent 22 stated, "*Technology related to medical treatment, Insurance companies should be open and adaptive to new treatment technologies as we have seen there have been a massive advancement is recoveries and health index of the patients receiving the treatment through cutting edge technologies, However the cost should be thoroughly analysed and should only reflect the actual service cost in the region."*

Respondent 5 highlighted, "*Annual savings of 5-20% are possible with self-funding or third-party payer plans, depending on plan design and funding methods*."

Regarding "Self-funding and third-party payers", Respondents 1 and 8 suggested, "*Machine and treatment costs have been reduced thanks to medical technology, which has reversed the trend of rising medical expenditures.*" Regarding the utilization of innovative technologies, respondent 12 has highlighted, "*When it comes to sharing data and making decisions about treatment plans and health outcomes; telemedicine, AI-enabled medical devices, and blockchain electronic health records have the potential to radically alter treatment practices. …., all communities will reap the benefits of new technologies in due time.*".

The fourth sub-theme was about the affordability of healthcare. According to respondent 25, "*Patients can pay a premium that is proportional to the average cost of medical treatment because insurance companies, hospitals, and other healthcare providers pool their resources to pay for people's medical care*". Whereas; respondent 18 put it as "*Health insurance lowers out-of-pocket costs.*"

4.1.2 Theme 2 - Innovative Technologies for Insurance Companies

Table 2: Innovative Technologies for Insurance Companies (Theme 2)

Meaning Units	Condensed Meaning Units	Sub-Themes	Theme
Innovative technologies can provide better service at low cost	Tech can provide low-cost better service	Adoption of Digital Technology and AI	Innovative technologies for Insurance companies
Insurance companies should promote their innovative technology to improve customer experience and drive growth	Insurers should promote innovation		
Insurance companies can adopt digital technology and AI to offer better products	Insurers should adopt digital tech		
Technology can improve customer engagement, lower costs, increase efficiency and expand insurability	Tech can improve engagement and costs	Tech and Customer Engagement	
Big data can bring benefits to insurers in underwriting, claim management, and settlement practices	Big data benefits for insurers	Big Data and Insurer Benefits	

Three sub-themes lead to Theme 2, "Innovative Technologies for Insurance Companies" as a result of the second question asked. Regarding the Adoption of Digital Technology and AI, Respondents 1 and 5 stated, "*Healthcare, nanomedicine, 3D printing, the internet of things (IoT), precision medicine, and virtual reality are just a few examples of the cutting-edge technology used by medical insurance firms to improve service while reducing costs. Insurance firms can better understand their clients' demands and provide better service with the use of these technologies*".

Furthermore, Respondent 30 mentioned, "*Insurance companies can enhance their client experience and expand their business by promoting their innovative and efficient technology*".

Regarding the innovative technology's application and adoption and customer engagement in insurance companies, Respondent 17 stated, "*Insurance firms may utilize more digital technology, AI, and the Internet of things to offer the best products and coverage*". Respondent 9 mentioned as, "*By leveraging technology, insurance companies may engage clients, reduce expenses, boost efficiency, and increase the number of people who can be insured*".

Regarding the third sub-theme, which is big data and insurer benefits, Respondents 18 and 15 emphasized, "*Data management systems for big data are challenging. The use of big data has the potential to enhance the underwriting, rating, and settlement processes of insurance companies.*"

4.1.3 Theme 3 - Innovative Technologies for Cost Containment

Table 3: Innovative Technologies for Cost Containment (Theme 3)

Meaning Units	Condensed Meaning Units	Sub-Themes	Theme
Strategic pricing assessment is essential for pricing strategy development	Strategic pricing assessment is vital	Cost-Effective Innovative Technology Selection	Innovative Technologies for Cost Containment
Providers should stress long-term cost-effective innovative technology selection	Long-term cost-effective tech selection		
DRG can estimate the cost of medical treatment	DRG estimates the cost of medical treatment	DRG Implementation	
Innovative technology can increase healthcare costs and demand for medical systems	Tech increases healthcare costs	Increase in Healthcare Costs due to Innovative Technology	
Innovative technology should be assessed in terms of efficiency and patient prognosis	Tech assessment should prioritize efficiency	Tech Assessment and Actionable Insight from Innovative Technology	
Innovative technology can provide actionable insight for early interventions	Tech provides actionable insight		

Questions related to cost of medical treatments, pricing strategy and use of innovative technologies particularly in the MENA region led to Theme 4 "Innovative Technologies for Cost Containment". According to Respondent 22, "*The initial stage in developing a pricing strategy that will help organisations and take advantage of market possibilities is conducting a strategic price evaluation. Complex as it may be, factors such as player price, citrate, packaging, public vs. private, and so on all have their advantages."*

Respondent 16 stated, "*Using an algorithm with predetermined base medical treatment charges, newly introduced DRG can estimate the process cost for insured patients individually.*"

Both the second question and its sub-questions pertained to the impact of cutting-edge technological developments on the management of healthcare expenditures, specifically about the impact of these developments on the control of medical claims costs and, by extension, the overall cost of medical treatment.

Respondent 19 highlighted, "*As a result of cost savings or high volume utilisation, innovative technology has the potential to lower medical claim expenses. Prioritising long-term, cost-effective innovation should be the focus of medical practitioners when selecting technology.*"

Furthermore; respondent 25 emphasized, "*Robotic operations have cut down on treatment times, while innovative devices like smartwatches can measure vital signs like heart rate and electrocardiogram. Plus, cancer is another issue that nanotechnology has the potential to resolve in a way that was previously impossible. Nevertheless, the demand for medical systems, pharmaceuticals, and surgical procedures has increased, and health care prices have risen as a result of novel medical technologies*".

According to respondent 29, "*It is important to assess new healthcare technologies for their ability to enhance patient treatment, decrease complications, and improve prognoses.*"

The third question and the related sub-questions addressed how innovative technology affects medical claims costs and MENA health trends. Respondents 7 and 24 stated, "*New ground-breaking technology has the potential to enhance patient health by providing actionable insights prior to any deterioration."*

4.1.4 Theme 4 - Challenges Insurance Companies face in MENA Region

Table 4: Challenges Insurance Companies face in MENA Region (Theme 4)

Meaning Units	Condensed Meaning Units	Sub-Themes	Theme
HIS system restrictions are hindering the usage of big data by insurers	HIS system restrictions hinder big data	HIS System Restrictions	Challenges Insurance Companies face in MENA Region
HIS system is not open to usage by insurers for better pricing	HIS system is not open to insurers		
Innovation technology faces challenges like high cost and abuse	Tech faces challenges like cost and abuse	Challenges in Implementing Innovative Technology	
Regulations restricting health data movement are a challenge	Regulations restrict health data movement		
Effective cost containment strategies are hard to identify and temporary	Hard to identify effective cost strategies	Challenges in Cost Containment Strategies	
New technologies are expensive and may not be covered by insurance	New tech is expensive and not insured		

The fourth theme extracted was "Challenges Insurance Companies face in MENA Region" The first question was related to any resistance to cost containment strategies for medical claims. According to respondents 16 and 30, "*Importantly, HIS system limits may force insurance companies to leverage big data for more accurate pricing. To increase utilisation, the majority of professionals employ referrals, tests, and treatments*".

Respondent 2 also agrees with the above statement by saying, "*Unfortunately, HIS is not open to insurance firms. When insurance businesses open up to big data, it can help them price policies better*."

The second question concerned cost-containment challenges for breakthrough technology. According to respondents 19, 5 and 7, "*The implementation of innovative technology to reduce costs is hindered by several factors, including high costs, misuse of indications, lower benefits than anticipated or intended, social awareness, and nation-specific issues with the economic, political, and regulatory bodies*".

On the other hand, respondent 26 thinks, "*There are issues with regulations. National health databases are becoming more common. A foundation of digitization and technology, cloud systems are forbidden by several regulations.*"

The last question was related to issues regarding cost containment strategies by insurance companies, hospitals, and healthcare providers in the MENA region. Respondents 9 and 17 state that "*It is challenging to discover*

efficient cost-control techniques since health cost-control measures only provide short-term relief until new technology is released. The main problem is that there is a lack of cooperation and open communication between the parties." Similarly, Respondents 22 and 31 stated, "*Insuring new technology can be a real challenge due to its high cost*."

5. Conclusion

In conclusion, it was found that while innovative technology is cost-effective, it is also more sensitive and necessitates the expertise of technical people, leading to higher expenses. Furthermore, effective management of claims and self-funding, strategic implementation of an ecosystem, integration of algorithms, AI, and machine learning, product design, financing, and proactive measures for prevention and reimbursement are essential strategies for managing medical cost claims.

Moreover, it has been shown that in many cases, patients demonstrate a preference for modern technology as opposed to conventional alternatives. However, the increasing medical expenses can be attributed to several factors, such as inadequate modifications of premiums to cover technological costs, improper utilization of medical indications, and a failure of health authorities to effectively control technology-related expenses, leading to unpredictable price fluctuations. The introduction of telemedicine, the use of AI-powered medical devices, and the integration of blockchain technology for electronic health records have greatly revolutionized the medical care industry. Governmental incentives, like as tax incentives and research and development (R&D) incentives, can promote the adoption of state-of-the-art technology.

To control medical costs, insurance companies employ automation and digitalization techniques, utilizing artificial intelligence and algorithms to reduce both medical costs and cases of fraud. Several other methods such as deductibles and co-payments can be used to control medical costs based on the client's previous records. Insurance companies are utilizing several innovative technologies, including Virtual Reality, Augmented Reality/Mixed Reality/Virtual Reality in Healthcare, Nanomedicine, 3D Printing, the Internet of Medical Things (IoMTs), and Precision Medicine, to deliver high-quality services at a lower cost.

All MENA countries are striving to enhance their healthcare infrastructure through investments in modern technology and cutting-edge equipment. Still, innovative technology also has its drawbacks. Overuse, abuse of indications, insufficient insurance coverage, and price reductions could potentially lead to an increase in medical claim costs and out-of-pocket payments.

It was further found that the MENA region has encountered numerous challenges as a result of inadequate infrastructure, economic and political instability, insufficient health authorities, and ineffective governance in managing the healthcare system. These challenges have caused an adverse impact on the proper utilization of innovative technology. Nevertheless, the MENA region is prepared to adopt and apply AI, big data, and automated systems in response to the increasing demand from clients for more sophisticated medical technologies.

The challenges stated as limiting the use of innovative technology in terms of cost reduction methods include substantial costs, misuse of indications, fewer benefits than expected or intended, public awareness, and specific characteristics of the country (such as economic, political, and regulatory factors). Moreover, the MENA region has significant challenges in terms of funds, investments, and the presence of qualified individuals and technical experts in the field of big data and artificial intelligence. These obstacles impede the progress and execution of innovative strategies for cost reduction.

6. Recommendations

This study investigated the impact of medical cost claims, the involvement of insurance companies, and the potential contributions of innovative technology. The study's findings will enhance the current body of literature on innovative technology by investigating a novel aspect of innovative technology in medical cost claims

and solutions for cost control. This study provides new insights while presenting a plausible explanation of how innovative technologies are being used in healthcare and their significance for medical costs. The findings will motivate insurance companies, healthcare providers, and hospitals to integrate innovative technology to improve the efficiency of medical cost claims and enhance the well-being of patients in the long run. These findings can contribute to the comprehension of how innovative technologies can be utilized to reduce medical costs.

Technological innovation in healthcare products has yielded numerous advantages for hospitals, doctors, and patients by enhancing their health outcomes and providing cost-effective technologies. The study's findings will be helpful for insurance professionals seeking to optimize the utilization of cutting-edge technologies like Virtual Reality or AR/MR/VR in fields such as Healthcare, Nanomedicine, 3D Printing, Internet of Medical Things (IoMTs), or Precision Medicine. These technologies can enable the delivery of high-quality services at a reduced cost. Medical insurance firms, health providers, and hospitals will have the capacity to gather a substantial volume of data regarding the patterns of medical claims and the health trends of their whole client base.

However, the main findings highlighted that insurance companies, healthcare providers, and hospitals can prioritize the use of innovative technologies to facilitate process automation and machine learning, leading to improved management of cost claims.

Additionally, the findings of the study might be employed to identify the possible challenges that the MENA region may face due to insufficient infrastructure, economic and political instability, poor health authorities, and ineffective governance in healthcare management. Identifying these obstacles will help relevant authorities address concerns that negatively affect the effective use of innovative technology. The results can also assist stakeholders and other relevant authorities in analyzing unidentified factors that affect innovative technology cost containment initiatives in the MENA region.

Author Contributions: All authors contributed to this research.

Funding: Not applicable.

Conflict of Interest: The authors declare no conflict of interest.

Informed Consent Statement/Ethics Approval: Not applicable.

References

Agustina, R., Dartanto, T., Sitompul, R., Susiloretni, K. A., Suparmi, Achadi, E. L., Taher, A., Wirawan, F., Sungkar, S., Sudarmono, P., Shankar, A. H., Thabrany, H., & Indonesian Health Systems Group (2019). Universal health coverage in Indonesia: concept, progress, and challenges. Lancet (London, England), 393(10166), 75–102. https://doi.org/10.1016/S0140-6736(18)31647-7

Akaranga, S.I. and Makau, B.K., 2016. Ethical considerations and their research applications: a case of the University of Nairobi. http://www.ztjournals.com/index.php/JEPER/article/view/429

Atun, R., de Andrade, L. O., Almeida, G., Cotlear, D., Dmytraczenko, T., Frenz, P., Garcia, P., Gómez-Dantés, O., Knaul, F. M., Muntaner, C., de Paula, J. B., Rígoli, F., Serrate, P. C., & Wagstaff, A. (2015). Health-system reform and universal health coverage in Latin America. Lancet (London, England), 385(9974), 1230–1247. https://doi.org/10.1016/S0140-6736(14)61646-9

"Bacchus Barua and Mackenzie Moir (2022). Understanding Universal Health Care

Reform Options: Cost-Sharing for Patients. Fraser Institute. <http://www.fraserinstitute.org>"

Bekfani, T., Fudim, M., Cleland, J.G., Jorbenadze, A., von Haehling, S., Lorber, A., Rothman, A.M., Stein, K., Abraham, W.T., Sievert, H. and Anker, S.D., 2021. A current and future outlook on upcoming technologies in remote monitoring of patients with heart failure. European Journal of Heart Failure, 23(1), pp.175-185. https://doi.org/10.1002/ejhf.2033

Blocher, E.J., Stout, D.E., Juras, P.E. and Smith, S., 2019. Cost Management (A Strategic Emphasis) 8e. McGraw-Hill Education.

Buitron de la Vega, P., Losi, S., Sprague Martinez, L., Bovell-Ammon, A., Garg, A., James, T., Ewen, A. M., Stack, M., DeCarvalho, H., Sandel, M., Mishuris, R. G., Deych, S., Pelletier, P., & Kressin, N. R. (2019). Implementing an EHR-based Screening and Referral System to Address Social Determinants of Health in Primary Care. Medical care, 57 Suppl 6 Suppl 2, S133–S139. https://doi.org/10.1097/MLR.0000000000001029

Burns, L. R., & Pauly, M. V. (2018). Transformation of the Health Care Industry: Curb Your Enthusiasm?. The Milbank quarterly, 96(1), 57–109. https://doi.org/10.1111/1468-0009.12312

Chen, H., Shi, L., Zhang, Y., Wang, X. and Sun, G., 2021. A cross-country core strategy comparison in China, Japan, Singapore, and South Korea during the early COVID-19 pandemic. Globalization and health, 17, pp.1-10. https://globalizationandhealth.biomedcentral.com/articles/10.1186/s12992-021-00672-w

Chen, J., Amaize, A., & Barath, D. (2021). Evaluating Telehealth Adoption and Related Barriers Among Hospitals Located in Rural and Urban Areas. The Journal of rural health : official journal of the American Rural Health Association and the National Rural Health Care Association, 37(4), 801–811. https://doi.org/10.1111/jrh.12534

Clarke, V., Braun, V. and Hayfield, N., 2015. Thematic analysis. Qualitative psychology: A practical guide to research methods, 222(2015), p.248.

Denis, JL., van Gestel, N. Medical doctors in healthcare leadership: theoretical and practical challenges. BMC Health Serv Res 16 (Suppl 2), 158 (2016). https://doi.org/10.1186/s12913-016-1392-8

Groves, P., Kayyali, B., Knott, D. and Kuiken, S.V., 2013. The big data revolution in healthcare: Accelerating value and innovation.

Gu, D., & Shen, C. (2020). Cost-Related Medication Nonadherence and Cost-Reduction Strategies among Elderly Cancer Survivors with Self-Reported Symptoms of Depression. Population Health Management, 23(2), 132-139. https://doi.org/10.1089/pop.2019.0035

Hansen, D.R., Mowen, M.M. and Heitger, D.L., 2021. Cost management. Cengage Learning.

Harriss, D. J., MacSween, A., & Atkinson, G. (2019). Ethical Standards in Sport and Exercise Science Research: 2020 Update. International journal of sports medicine, 40(13), 813–817. https://doi.org/10.1055/a-1015-3123

Levin, C., & Chisholm, D. (2016). Cost-Effectiveness and Affordability of Interventions, Policies, and Platforms for the Prevention and Treatment of Mental, Neurological, and Substance Use Disorders. In V. Patel (Eds.) et. al., Mental, Neurological, and Substance Use Disorders: Disease Control Priorities, Third Edition (Volume 4). The International Bank for Reconstruction and Development / The World Bank.

Lo, E.Y., Bowler, J., Lines, T., Melton, C., Volkmer, R., Majekodunmi, T. and Krishnan, S.G., 2021, May. Operating room efficiency and cost reduction in shoulder arthroplasty: is there an advantage of a dedicated operating room team?

Martin, D., Miller, A. P., Quesnel-Vallée, A., Caron, N. R., Vissandjée, B., & Marchildon, G. P. (2018). Canada's universal health-care system: achieving its potential. Lancet (London, England), 391(10131), 1718–1735. https://doi.org/10.1016/S0140-6736(18)30181-8

Morse, S., Graham, J., Edwards, N., Keefe, J., Bourgeault, L., & Baker, M. (2019). Telehealth in Rural Canada: Emergent Technologies to Address Historical Issues. Canadian Journal of Nursing Informatics, 15(2). https://cjni.net/journal/?p=7188

Mossialos, E. and Le Grand, J., 2019. Cost containment in the EU: an overview. Health care and cost containment in the European Union, pp.1-154.

Mulcahy, A.W., Hlávka, J.P. and Case, S.R., 2018. Biosimilar cost savings in the United States: initial experience and future potential. Rand Health Quarterly, 7(4).

National Academy of Engineering (US); Institute of Medicine (US); Ekelman KB, editor. New Medical Devices: Invention, Development, and Use. Washington (DC): National Academies Press (US); 1988. A Conflict: Medical Innovation, Access and Cost Containment. Available from: https://www.ncbi.nlm.nih.gov/books/NBK218279/

Özdemir, V., & Hekim, N. (2018). Birth of Industry 5.0: Making Sense of Big Data with Artificial Intelligence, "The Internet of Things" and Next-Generation Technology Policy. Omics : a journal of integrative biology, 22(1), 65–76. https://doi.org/10.1089/omi.2017.0194

Price, C. P., Fay, M., & Hopstaken, R. M. (2021). Point-of-Care Testing for D-Dimer in the Diagnosis of Venous Thromboembolism in Primary Care: A Narrative Review. Cardiology and therapy, 10(1), 27–40. https://doi.org/10.1007/s40119-020-00206-2

Stadhouders, N., Kruse, F., Tanke, M., Koolman, X., & Jeurissen, P. (2019). Effective healthcare cost-containment policies: A systematic review. Health policy (Amsterdam, Netherlands), 123(1), 71–79. https://doi.org/10.1016/j.healthpol.2018.10.015

Stratview Research. (2021, March). Digital Health Market: Global Industry Trends, Share, Size, Growth, Opportunity and Forecast 2020-2025. https://www.technavio.com/report/digital-health-market-size-industry-analysis

Terry, G., Hayfield, N., Clarke, V., & Braun, V. (2017). Thematic analysis. In The SAGE Handbook of Qualitative Research in Psychology (pp. 17-36). SAGE Publications Ltd, https://doi.org/10.4135/9781526405555

Vatandoost, M., & Litkouhi, S. (2019). The Future of Healthcare Facilities: How Technology and Medical Advances May Shape Hospitals of the Future. Hospital Practices and Research, 4(1), 1-11. https://doi.org/10.15171/hpr.2019.01

Yao, X., Dembe, A.E., Wickizer, T. and Lu, B., 2015. Does time pressure create barriers for people to receive preventive health services? Preventive medicine, 74, pp.55-58.

Yaqoob, I., Salah, K., Jayaraman, R. and Al-Hammadi, Y., 2022. Blockchain for healthcare data management: opportunities, challenges, and future recommendations. Neural Computing and Applications, 34(14), pp.11475-11490. https://doi.org/10.1007/s00521-020-05519-w

Zeadally, Sherali & Bello, Oladayo. (2019). Harnessing the Power of Internet of Things based Connectivity to Improve Healthcare. Internet of Things. 14. 100074. https://doi.org/10.1016/j.iot.2019.100074

APPENDIX: Profile of the Interviewees

Table 5: List of Interviewees

Participant	Experience(Years)	Industry	Country / Region	Position
1	23	Insurance	UAE	C-Suite
2	34	Insurance	MEA	C-Suite
3	21	Insurance	Egypt	C-Suite
4	26	Insurance	META	Doctor
5	20	Healthcare Provider	Morocco	Doctor
6	20	Healthcare Provider	Lebanon	Doctor
7	20	Third Party Administrator	MEA	Doctor
8	20	Healthcare Provider	Bahrain	Doctor
9	16	Third Party Administrator	Egypt	Doctor
10	28	Third Party Administrator	Lebanon	Doctor
11	25	Third Party Administrator	MEA	Doctor
12	28	Third Party Administrator	MEA	Doctor
13	20	Insurance	Lebanon	C-Suite
14	16	Insurance	Egypt	Doctor
15	20	Insurance	Turkey	Doctor
16	26	Insurance	Lebanon	Doctor
17	16	Insurance	Lebanon	C-Suite
18	20	Insurance	MEA	Executive Management
19	18	Insurance	MEA	Executive Management
20	20	Insurance	MEA	Executive Management
21	18	Third Party Administrator	MEA	Executive Management
22	16	Third Party Administrator	Lebanon	Doctor
23	19	Insurance	Turkey	C-Suite
24	16	Third Party Administrator	Saudi Arabia	Executive Management
25	18	Insurance	Qatar	Executive Management
26	20	Insurance	UAE	C-Suite
27	20	Insurance	Morocco	Executive Management
28	23	Third Party Administrator	Egypt	C-Suite
29	19	Insurance	Bahrain	Executive Management
30	17	Insurance	Saudi Arabia	Executive Management
31	17	Insurance	Tunisia	C-Suite
32	15	RE-Insurance	MEA	Executive Management
33	15	Insurance	UAE	Executive Management
34	24	Insurance	Saudi Arabia	Executive Management

Note: MEA: Middle East & Africa; UAE: United Arab Emirates

The Asian Institute of Research
Economics and Business Quarterly Reviews
Vol.7, No.1, 2024: 55-71
ISSN 2775-9237

DOI: 10.31014/aior.1992.07.01.559

Barriers to Entrepreneurial Intentions of Rural Women: A Case Study in North Western Province, Sri Lanka

Lakmini K. Herath[1]

[1] Graduate School of Arts and Sciences, International Christian University, Tokyo, JAPAN.
E-mail: lk2herath@gmail.com

Abstract
Micro and small-scale entrepreneurship is essential in alleviating poverty and promoting development. This study examines the statistically significant effect of sixteen barriers on rural women's entrepreneurial intention using primary data obtained through a structured questionnaire from 213 rural women who have participated in the North Western Province's Department of Rural Development's skills development program in Sri Lanka. Furthermore, this article examines the impact of demographic factors (age, marital status, highest level of education, number of children, and monthly household income) on rural women's entrepreneurial intentions using an analysis of variance. Findings indicated that lack of confidence in the business idea and lack of necessary practical details to start a firm have a statistically significant negative effect on entrepreneurial intention. Furthermore, marital status has a statistically significant impact on entrepreneurial intention. The study is critical because its findings fill a gap in the literature through quantitative analysis of the barriers facing rural women in entrepreneurial start-ups. It will aid in developing more effective government policies and planning decisions related to rural women's entrepreneurship development.

Keywords: Barriers, Entrepreneurship, Entrepreneurial Intention, Rural Women

JEL Codes: B54, L26, M13

1. Introduction

1.1 Importance of Women's Entrepreneurship in Sri Lanka

***A means of escaping poverty*:** In Sri Lanka, rural areas account for 84% of poor households. According to labour force statistical data in 2020, the economically inactive female population in Sri Lanka is 73.5%, and 60.3% are engaged in housework. The economically inactive rural female population accounts for 74.1%. According to the distribution of economically inactive rates by standardized age groups, 55.9% of those aged 25 to 34 and 56.1% of those aged 35 to 54 fall into this category (Department of Census and Statistics Sri Lanka, 2020). As a result, female entrepreneurship development is crucial for Sri Lanka's economic and social development, particularly among rural women. Globally, micro and small-scale enterprises are well known for their immense contribution to poverty reduction. Removing barriers could create more significant opportunities for rural women to start their

micro or small-scale enterprises, contributing to women's economic empowerment, gender equality, job creation, and poverty reduction. Not only poverty reduction but also, according to The Economist (2013), women reinvest 90% of their earnings in their families and communities. Therefore, investing in women is an investment in our collective future.

1.2 North Western Province, Sri Lanka

The study is based in Sri Lanka's North Western Province. Sri Lanka's North Western Province is divided into two districts: Kurunegala and Puttalam. North Western Province has 46 divisional secretariat areas ("Divisional Secretariat" is an administrative division). Puttalam has 16 divisional secretariat areas, while Kurunegala has 30. In 2021 the population of Kurunegala District is 1,743,000, whereas Puttalam District has a population of 849,000. According to Sri Lanka's new poverty line, the poverty headcount index in 2019 was 14.3 percent. North Western Province has a poverty headcount index of 11.8 percent, proportioning to a total poverty rate of 9.7 percent. The poverty headcount index in Kurunegala district is 12.5 percent, while it is 10.5 percent in Puttalam district. Kurunegala district has the third-highest percentage of contribution to total poverty (6.9) among Sri Lanka's 25 districts. It is 2.8 percent in the Puttalam district. (Department of Census and Statistics, 2022).

According to the Annual Report of the Sri Lanka Labour Force Survey, 2020, by the Department of Census and Statistics, the unemployment rate in North Western Province is 4.3 percent. The percentage of economically active females in the Kurunegala district is 38.7 percent, and it is 30.8 percent in the Puttalam district.

1.3 Women's Skills Development Program Conducted by the Department of Rural Development in North Western Province, Sri Lanka

One of the main objectives of the Department of Rural Development in Sri Lanka's North Western Province is to alleviate poverty among rural women and their families. Under the objective mentioned above, the critical activity is encouraging rural women to start micro or small-scale enterprises. To fulfill that, the Department of Rural Development in Sri Lanka's North Western Province organizes skills development programs for rural women in all 46 divisional secretariat areas every year to assist rural women in starting their micro or small-scale enterprises. This skills development program serves nearly 1,000 rural women in Sri Lanka's North Western Province each year. The percentage of rural women who start their micro or small-scale enterprises is around 35.00 percent (Department of Rural Development, 2019). This gives the base for the research question: Why have these trained women not started any entrepreneurial activity yet?. Indicating that simply providing a skills development program will not alone help rural women start their enterprises. There may be several barriers for these women, and identifying those barriers and their Entrepreneurial Intention is critical in developing rural women's entrepreneurship, which is the focus of this study.

1.4 Study Area

Women face several barriers when trying to engage in entrepreneurial activities. Due to specific social, cultural, economic, and geographic constraints, such barriers are more visible in rural communities. Studies found that barriers women face in starting entrepreneurial activities include financial, family, market, institutional and organizational, personality and behavioural, and geographic. Removing such barriers could create opportunities for rural women to start their enterprises.

This paper quantitatively identifies the barriers preventing the start-up of micro and small-scale enterprises by rural women in the North Western Province of Sri Lanka. It analyzes the relationship between Entrepreneurial Intention and Barriers. The data for this study came from a sample of 213 rural women who completed a skills development program conducted by the Department of Rural Development in Sri Lanka's North Western Province. From aforesaid primary data, this study analyzes the following barriers: (1) Fear of failure, (2) Family duties, (3) Start-up cost, (4) Technical and business knowledge, (5) Management and entrepreneurial skills, (6) Practical details to start a firm, (7) Lack of experience and exposure, (8) Confidence, (9) Competitors, (10) Support of organizations, (11) Assistance in accessing the viability, (12) Time Constraints, (13) Lack of opportunities, (14)

Long-distance, (15) Difficult to get access to utilities, and (16) Lack of sufficient support from government organizations have a statistically significant negative effect on Entrepreneurial Intention of the rural women. Moreover, this study analyzes whether there is a significant relationship between Entrepreneurial Intention and the Demographic Variables: (1) Age group, (2) Marital status, (3) Highest education level, (4) Monthly household income category, (5) Number of children, and (6) Age category of the children. By the findings, this study fills the gap in the literature by quantitatively identifying the barriers to rural women's entrepreneurial start-ups and the relation between Entrepreneurial Intention and Barriers to rural women's entrepreneurship.

2. Literature Review and Conceptual Framework

2.1 Entrepreneurial Intention

In general, '*intention*' refers to thinking about, aiming for, or planning to achieve something. It can also be committing to a specific activity now or in the future. According to Ajzen (1991), intentions determine how much people want to do and how hard they plan to work to execute a given behaviour. Bird & Jelinek (1998) define *intention* as "A state of mind, leading attention, experience, and actions towards a specific goal (object) or pathway to its achievement." The intention of each individual varies and is also affected by time (Thompson, 2009). It is up to the individual to decide whether or not to engage in a particular behaviour.

Entrepreneurial intentions are commitments to creating a new business, and a strong desire should include at least an attempt to start a firm. Entrepreneurial intentions can take the shape of a formalized plan or choice and can be implemented now or in the future (Krueger, 1993). According to Dutta and Thornhill (2008), Entrepreneurial Intention is the desire to own a business or start a new one.

Carsrud, Krueger, and Reilly (2000) found that intention-based models are more highly predictive of entrepreneurial behaviour than individual-variable models. Many academics and scholars have produced various models to explore entrepreneurial goals and other intentions such as education, personal attitude, personal qualities, culture, social conventions, and various other aspects. Shapero (1982) created the Entrepreneurial event model; Huefner et al. (1991) created the Entrepreneurial attitude orientation model; Carsrud et al. (2000) created the Intentional basic model, and so on. Ajzen (1991) created the Theory of Planned Behavior (TPB), regarded as the most refined intention model for studying the impact of intentionality on entrepreneurial behaviour.

It has previously shown a clear link between barriers and entrepreneurial intentions. According to Wagner's (2007) results, there is a direct link between fear of failure and entrepreneurial intentions. Franke and Lüthje (2003) investigated engineering students' attitudes and entrepreneurial intentions in several countries (the United States, Canada, Asia, and Europe). They discovered a direct link between perceived entrepreneur support, perceived barriers to entrepreneurship, and students' intention to pursue an entrepreneurial career. They concluded that people are less inclined to become entrepreneurs if they perceive an unfriendly atmosphere for firm founders. A positive assessment of the support provided to potential business founders links to a greater likelihood of pursuing a career as an entrepreneur.

Pruett, Shinnar, and Toney (2009) discovered a direct link between the perceived relevance of barriers and behavioural intentions in their study of Spanish, American, and Chinese students. Individuals who perceive a lack of knowledge, business hazards, and funding are less likely to have solid entrepreneurial intentions.

People are generally delighted and engaged in entrepreneurial efforts. They can express or possess entrepreneurial ambition and take proper steps to start a new business, which various variables can stifle or affect.

2.2 Barriers to Women's Entrepreneurship

Entrepreneurs are essential drivers of economic and social change, according to the World Economic Forum (2013). Verheul & Thurik, Verheul, and Zwan (2012) define five levels of the entrepreneurial process, namely" never considered starting a business, thinking about starting a business, taking steps to start a business (nascent

entrepreneurs), running a business for less than three years and running a business for more than three years." (p. 628).

According to Linder and Sperber (2018), personal evaluations of their entrepreneurial ecosystem link to entrepreneurial decisions. The World Economic Forum (2013) identifies seven components of an entrepreneurial ecosystem: markets, human capital, funding and finance, the regulatory framework and infrastructure, education and training, culture, and a support system.

According to Li, Wu, and Zhang (2019), most research on women's entrepreneurship has centred on their obstacles. From an empirical study, Thurik, Verheul, and Zwan (2012) found that men are more likely to consider entrepreneurship a career than women, and men are more likely to undertake nascent activities. However, at the later stages of the entrepreneurial process, this gender difference tends to disappear.

In their study on the barriers to women's entrepreneurship in Canada, Glass et al. (1992) identified the following barriers: a lack of training and experience in business management, a lack of financial support and an information network, and an inappropriate family environment, and negative attitudes toward women.

According to Kaur and Sidhu (2006), human and environmental factors influence women's entrepreneurial development. Hard labour, technical expertise, risk tolerance, innovativeness, and work experience influence rural women's entrepreneurial development. Environmental factors include infrastructure facilities, entrepreneurial activity capacity, supplier availability, and institutional backing.

In a study, Jahangiri et al. (2006) looked at the role of women in rural economic activities in the province of Fars. The findings revealed a link between education and economic participation among rural women. With age, women's economic engagement rises. The study ultimately discovered that women's attitudes toward their work are the most influential factor influencing their economic participation rate variations.

The study of Fallah-Jelodar et al. (2007) identified financial and credit supports, technical-vocational courses, family networks, governmental support policies, availability and the use of both individual and group information channels and sources, and affiliation in rural associations as the most significant in the success of rural women's entrepreneurship.

The empirical study by Wagner (2007) confirms that the degree and effect of considering fear of failure as a reason not to start one's own business differs significantly between men and women, which is relevant for explaining the sex gap in entrepreneurship.

According to Shahhosseini (2008), women face particular cultural, economic, and societal challenges regarding entrepreneurship and business enterprises. As a result of distinct cultural and social factors, such limitations are more visible in rural communities. On the way to entrepreneurship, rural women confront more barriers than urban women.

From exploratory qualitative research, Farani and Movahedi (2012) identify nine barriers to rural women's entrepreneurship. These barriers include individual, personality and behavioural, family, education, social and cultural, facilities and services, legal, financial, institutional, and geographical barriers.

Linder and Sperber (2018) found that financial support is an essential motivator for men and women in entrepreneurial decisions, and females rely more on social support. Camelo-Ordaz, Diánez-González, and Ruiz-Navarro (2016), from an empirical study, found that "gender decisively influences their entrepreneurial intention." (p.261). Furthermore, three mediators between gender and entrepreneurial intention were found: self-efficacy, fear of failure, and ability to recognize opportunities.

According to Hechavarria and Ingram (2018), women are more likely to engage in entrepreneurship when the entrepreneurial environment includes low barriers to entry, supportive government policy toward entrepreneurship, limited commercial and legal infrastructure, and a normative culture that encourages it.

Li, Wu, & Zhang (2019). Discoveries demonstrate that weak female entrepreneurial cognitions and a high initial funding demand result in low female entrepreneurship. In addition, the findings highlight a low initial funding requirement as a crucial incentive for female entrepreneurship development.

In conclusion, findings from entrepreneurship research demonstrate that numerous elements might be barriers to women's entrepreneurship development. This study analyzes the barriers that affect the Entrepreneurial Intention of rural women. Despite this, it fills a gap in the literature by quantitatively analyzing rural women's barriers to starting a business.

2.3 Conceptual Framework

According to this study's model, demographics and barriers to women entrepreneurship considerably impact entrepreneurial intention. *Figure 1* shows the conceptual framework for this research.

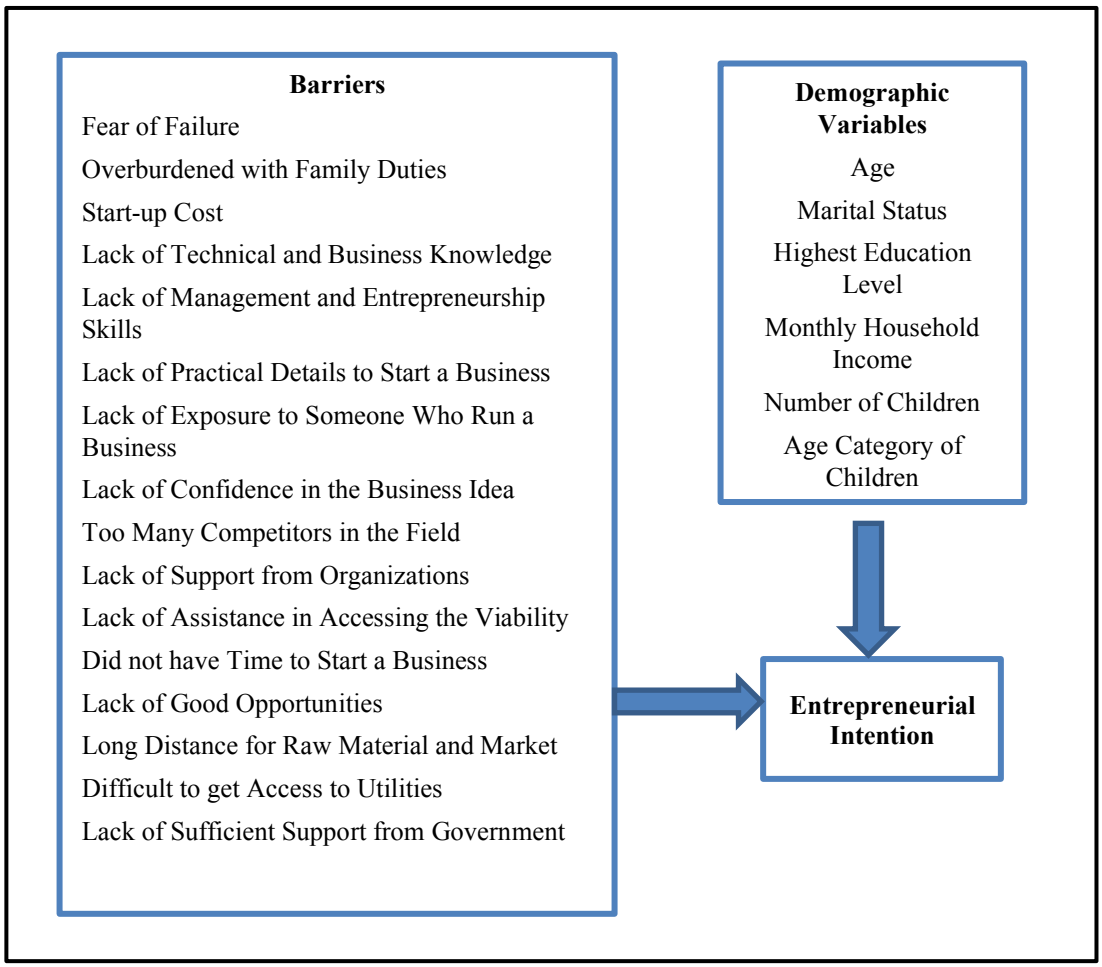


Figure 1: Conceptual Framework of the Study

Source: Developed by the Author

3. Method

3.1 Research Methodology

3.1.1. Sample Selection

This paper analyzes micro-cross-sectional data from 213 female participants in the skills development program conducted by the Department of Rural Development in Sri Lanka's North Western Province. Primary data was collected for this study by distributing a questionnaire to 230 women.

The method used to select the sample is as follows. In 2018, the Department of Rural Development's skills development program was conducted in 41 Divisional Secretariat divisions in the North Western Province in Sri Lanka. Eight hundred sixty-three women participated in the program. Five hundred forty-eight women have not started any micro or small-scale enterprise. Therefore, data was collected from the women who had not started any micro or small-scale enterprise for the day the research questionnaire was distributed. *Random sampling* is used to select 23 divisional secretariat areas out of 41, followed by another simple random sampling to choose ten women from each of the 23 selected divisional secretariat areas.

3.1.2. Definition of Variables

Table 1 contains the codes of the dependent variable, independent variables, and the demographic variables used in this study.

Table 1: Variable codes, descriptions and types

No.	Description	Variable Code	Variable Type
Dependent Variable			
01	Entrepreneurial intension	EI	Quantitative Continuous
Independent Variables			
02	Fear of failure	FEAR	Ordinal Variable
03	Overburdened with family duties	FAMILY	Ordinal Variable
04	Cannot afford start-up cost	COST	Ordinal Variable
05	Lack of technical and business knowledge	KNOWLEDGE	Ordinal Variable
06	Lack of management and entrepreneurship skills	SKILLS	Ordinal Variable
07	Lack of necessary practical details to start the business	PRACTICAL	Ordinal Variable
08	Lack of experience or exposure to someone who has run a business	EXPOSURE	Ordinal Variable
09	Not confident of the business idea	CONFIDENCE	Ordinal Variable
10	Too many competitors in the field	COMPETITORS	Ordinal Variable
11	Lack of support of organizations	SUPPORT	Ordinal Variable
12	Lack of assistance in assessing the viability of the business	VIABILITY	Ordinal Variable
13	Did not have time to start the business	TIME	Ordinal Variable
14	Lack of good opportunities	OPPORTUNITIES	Ordinal Variable
15	Long distance to centres providing raw materials and market	DISTANCE	Ordinal Variable
16	Difficult to get access to utilities	UTILITIES	Ordinal Variable
17	Lack of sufficient support from the government	GOVERNMENT	Ordinal Variable
Demographic Variables			
18	Age category	AGE	Nominal Variable
19	Marital status	MARI_STATUS	Nominal Variable
20	Highest education level achieved	EDUCATION	Nominal Variable

21	Number of children	CHILDREN	Nominal Variable
22	Age category of the participant's children	CHILD_AGE	Nominal Variable
23	Monthly household income category	INCOME	Nominal Variable

3.1.3. Questionnaire Design

This study uses a questionnaire as the survey instrument. This questionnaire was developed by referring to the Global Entrepreneurship Monitor 2001 National Expert Questionnaire Autio, E., Hechavarria, D.M., & Reynolds, P.D. (2008), Exploring entrepreneurial intentions among university students in Bangladesh by Ahmed, M.(2020), An investigation into the determinants of women entrepreneurship by Meyer, N.(2009), Barriers to entrepreneurial endeavours in a developing economy by Bakri, M., Bizri, R.M., Dani, A., Kojok, A., & Mokahal, M.(2012), and the analysis of the barriers and limitations for the development of rural women's entrepreneurship by Farani, A.Y., & Movahedi, R. (2012). A pretest of 20 individuals was undertaken to strengthen the reliability of the survey evidence.

The questionnaire used in this study has two sections (Section A and Section B). Section A consists of six (06) Demographic questions. Section B of the questionnaire consists of twenty-one (21), five-point (05) Likert scale questions from Strongly Agree (1) to Strongly Disagree (5).

3.2 Empirical Methodology

The two hypotheses of this study are,

Hypothesis 1(H1): *Each demographic variable (age, marital status, highest education level, monthly household income, and number of children) has a statistically significant effect on entrepreneurial intention among the participants.*

Hypothesis 2(H2): *Selected 16 barriers to entrepreneurship have a statistically significant negative impact on entrepreneurial intention among the participants*.

To test Hypothesis 1 **(**H1), an analysis of variance was run on demographic variables: Age, Marital status, Highest education level, monthly household income, and Number of children, which are independent variables, and entrepreneurial intention as the dependent variable.

To test Hypothesis 2(H2), a regression model (*Equation 01*) is analyzed using the Multiple Linear Regression method with the R statistical program.

$$EI = \beta_0 + \beta_1 FEAR + \beta_2 FAMILY + \beta_3 COST + \beta_4 KNOWLEDGE + \beta_5 SKILLS + \beta_6 PRACTICAL + \beta_7 EXPOSURE + \beta_8 CONFIDENCE + \beta_9 COMPETITORS + \beta_{10} SUPPORT + \beta_{11} VIABILITY + \beta_{12} TIME + \beta_{13} OPPORTUNITIES + \beta_{14} DISTANCE + \beta_{15} UTILITIES + \beta_{16} GOVERNMENT + \varepsilon \quad (1)$$

Information,

EI	=	Entrepreneurial Intention
FEAR	=	Fear of failure
FAMILY	=	Overburdened with family duties
COST	=	Cannot afford start-up cost
KNOWLEDGE	=	Lack of technical and business knowledge
SKILLS	=	Lack of management and entrepreneurship skills
PRACTICAL	=	Lack of necessary practical details to start the business
EXPOSURE	=	Lack of experience or exposure to someone who has run a business
CONFIDENCE	=	Not confident of the business idea

COMPETITORS	=	Too many competitors in the field
SUPPORT	=	Support of organizations
VIABILITY	=	Assistance in assessing the viability of the business
TIME	=	Did not have time to start the business
OPPORTUNITIES	=	Lack of good opportunities
DISTANCE	=	Long distance to centres providing raw materials and market
UTILITIES	=	Difficult to get access to utilities
GOVERNMENT	=	Lack of sufficient support from the government
β_0	=	Intercept
β_1	=	Coefficient of FEAR
β_2	=	Coefficient of FAMILY
β_3	=	Coefficient of COST
β_4	=	Coefficient of KNOWLEDGE
β_5	=	Coefficient of SKILLS
β_6	=	Coefficient of PRACTICAL
B_7	=	Coefficient of EXPOSURE
β_8	=	Coefficient of CONFIDENCE
β_9	=	Coefficient of COMPETITORS
β_{10}	=	Coefficient of SUPPORT
β_{11}	=	Coefficient of VIABILITY
β_{12}	=	Coefficient of TIME
β_{13}	=	Coefficient of OPPORTUNITIES
β_{14}	=	Coefficient of DISTANCE
β_{15}	=	Coefficient of UTILITIES
β_{16}	=	Coefficient of GOVERNMENT
ε	=	Error

The steps followed for the Empirical Analysis consist of assessing the reliability of the dataset, two ANOVA (Analysis of Variance) assumption (assumption of homogeneity of variance and assumption of normality) tests, and four regression assumptions such as Normality, Linearity, Homoscedasticity, and Multicollinearity.

4. Results

4.1 Reliability of the Questionnaire

The initial estimation of this study is Cronbach's alpha. Cronbach's alpha is a method for determining the reliability of a questionnaire. It provides a simple approach to determining whether a score is reliable. Cronbach's alpha measures internal consistency. It is a scale of reliability (Shrestha, 2021). The basic rule is that the alpha coefficient range between 0.7 and 0.8 is acceptable, values between 0.8 and 0.9 are good, and 0.9 and above are excellent. The questions on entrepreneurial intention have a Cronbach alpha value of 0.79, whereas the questions on barriers have a Cronbach alpha value of 0.73. As a result, the questionnaire's reliability is found to be acceptable.

4.2 Profile of the Respondents

Table 2 shows the respondents' demographic characteristics.

Table 2: Demographic Characteristics of Respondents

Variable	Frequency	Percentage
Age		
Less than 20	02	0.9
20 to 30	39	18.3
31 to 40	70	32.9
41 to 50	61	28.6
Above 50	41	19.2
Marital Status		
Widowed	12	5.6
Unmarried	20	9.4
Married	181	85.0
Highest Education Level		
No Schooling	00	0.0
Primary	06	2.8
Secondary	14	6.6
General Certificate of Education, Ordinary Level	112	52.6
General Certificate of Education, Advanced Level	72	33.8
Diploma	07	3.3
Degree or Higher	02	0.9
Number of Children		
None	31	14.6
One (01)	33	15.5
Two (02)	102	47.9
Three (03)	36	16.9
Four (04)	09	4.2
Five (05)	02	0.9
Age Category of the Children		
01 to 05	64	16.4
06 to 10	85	21.7
11 to 18	138	35.3
Above 18	104	26.6
Monthly Household Income		
Less than LKR 20,000	96	45.1
LKR 20,000 to 30,000	58	27.2
LKR 30,000 to 40,000	30	14.1
LKR 40,000 to 50,000	20	9.4
Above LKR 50,000	09	4.2

Source: Processed Primary Data (2021)

4.3 ANOVA (Analysis of Variance)

The demographic variables were used as independent variables, and the entrepreneurial intention was used as the dependent variable in an analysis of variance. Except for marital status, the results of the analysis show that none of the demographic variables statistically impact entrepreneurial intention. The only demographic variable with a statistically significant F-statistic (Sig. 0.00383 > 0.05) was marital status, indicating that different respondents' Marital Status have statistically different entrepreneurial intentions. *Table 3* shows the ANOVA results for Demographic Variables and Entrepreneurial Intention.

Table 3: ANOVA results for Demographic Variables and Entrepreneurial Intention

Variable	Degrees of Freedom(df)	Sum of Squares	Mean Square	F value	Sig.
AGE	4	1.05	0.2614	1.234	0.298
Residuals	208	44.07	0.2119		
MARI_STATUS	2	1.96	0.9797	5.716	0.00383**
Residuals	210	35.99	0.1714		
EDUCATION	5	1.28	0.2565	1.448	0.209
Residuals	207	36.67	0.1772		
CHILDREN	5	1.43	0.2853	1.617	0.157
Residuals	207	36.53	0.1764		
INCOME	4	1.58	0.3941	2.254	0.0645
Residuals	208	36.38	0.1749		

Source: Processed Primary Data (2021)

Note: ** Sig at the level < 5%

The variances of the distributions of the populations are assumed to be identical in ANOVA. The ANOVA test is used to examine the plausibility of the null hypothesis, which states that all data come from the same underlying group with the same level of variability. As a result, if the variances of each group differ from the start, the null hypothesis will be rejected (within specific bounds), and there will be no purpose in employing ANOVA. Therefore, Bartlett's test is used in this study to test the assumption of homogeneity of variance. Bartlett's test examines the null hypothesis that the variances of the groups are equal versus the alternative hypothesis that the variances of the groups are not equal. *Table 4* contains the results of Bartlett's test for the MARI_STATUS (marital status) variable.

Table 4: Bartlett's Test of Homogeneity of Variances

Bartlett's K-squared	Degrees of Freedom(df)	p-value
0.37548	2	0.8288

Source: Processed Primary Data (2021)

Note: The p-value is 0.8288 which is above 0.05. Thus, the homogeneity of variances is accepted.

4.3.1. Tukey Multiple Comparisons of Means

Tukey's multiple comparison test is one of the various tests that can be used to discover which group of means differs from the others. The Tukey multiple comparison test is used to compare the difference between each pair of means because the ANOVA test concludes that there is evidence that the group means differ in MARI_STATUS (marital status). The results of the Tukey test are shown in *Table 5*. According to the test results, the p-value for the difference between each pair of means, widow-married and widow-unmarried, is statistically significant.

Table 5: Test Results of Tukey Multiple Comparison of Means

Marital Status	Difference	Lower	Upper	P Adjacent
unmarried-married	-0.1021409	-0.33241168	0.1281299	0.5481059
widow-married	0.3853591	0.09405684	0.6766614	0.0057777
widow-unmarried	0.4875000	0.13066742	0.8443326	0.0041579

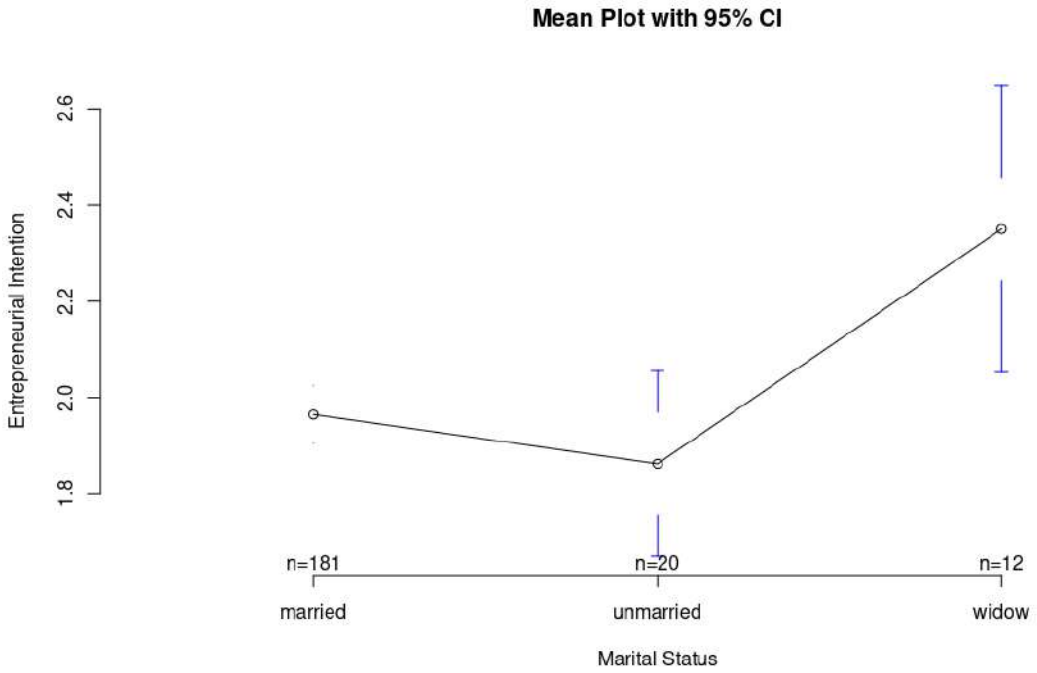
Source: Processed Primary Data (2021)

Note: 95% Confidence Level

According to *Figure 2*, in comparison to married (1.96) and unmarried (1.86) women, widows had a significantly higher mean value of Entrepreneurial Intention (2.35). Since the questionnaire's Likert scale runs from Strongly

Agree (1) to Strongly Disagree (5), widows have lower Entrepreneurial Intention than married and unmarried women.

Figure 2: Mean plot of Entrepreneurial Intention vs. Marital Status



Source: Author's Compilation

4.4 Correlation

Pearson correlation was used in this study to analyze the strength and direction of the relationships between variables. It is critical to understand the link between variables to assess whether there is any influence. Correlation values should range from +1 to -1, with +1 indicating positive associations and -1 indicating negative relationships (Pallant, 2013).

As a result, the associations between the dependent and independent variables are negative except for the independent variables, SUPPORT and COST, as shown in *Table 6*. It is also crucial to figure out how strong the connections between variables are. The r-value can be used to assess the strength of the correlation using the rule of thumb: r = 0: No Relationship, 0 > r > ±.15: Very Weak Relationship, r in between ±0.16 to ±.30: Weak Relationship, r in between ±.31 to ±.45: Moderate Relationship, r in between ±.46 to ±.60: Strong Relationship, and r above ±.60: Very Strong Relationship (Cohen, 1988).

Table 6: Strength of Relationship between Dependent and Independent Variables

Variables	**Correlation Value**	**Strength of Relationship**
EI to FEAR	-0.1099	Very Weak Relationship
ET to FAMILY	-0.1214	Very Weak Relationship
EI to COST	0.0621	Very Weak Relationship
EI to KNOWLEDGE	-0.1849	Weak Relationship
EI to SKILLS	-0.1649	Weak Relationship
EI to PRACTICAL	-0.3088	Moderate Relationship
EI to EXPOSURE	-0.2099	Weak Relationship
EI to CONFIDENCE	-0.4884	Strong Relationship
EI to COMPETITORS	-0.1690	Weak Relationship

EI to SUPPORT	0.0715	Very Weak Relationship
EI to VIABILITY	-0.0287	Very Weak Relationship
EI to TIME	-0.1111	Very Weak Relationship
EI to OPPORTUNITIES	-0.1705	Weak Relationship
EI to DISTANCE	-0.0185	Very Weak Relationship
EI to UTILITIES	-0.1362	Very Weak Relationship
EI to GOVERNMENT	-0.0005	Very Weak Relationship

Source: Processed Primary Data (2021)

4.5 Regression Analysis

4.5.1. Summary Statistics of the Regression Model

Summary statistics of the dependent variable and the independent variables are shown the *Table 7*.

Table 7: Summary Statistics of the Dependent and Independent Variables of the Regression Model

Variable Code	Number of Observations	Minimum	Maximum	Mode	Mean	Standard Deviation
EI	213	1.00	3.20	2	1.98	0.40
FEAR	213	1.00	5.00	4	3.20	1.12
FAMILY	213	1.00	5.00	4	3.58	1.00
COST	213	1.00	5.00	2	2.49	1.01
KNOWLEDGE	213	1.00	5.00	4	3.20	1.00
SKILLS	213	1.00	5.00	4	3.36	0.92
PRACTICAL	213	1.00	5.00	4	3.27	0.94
EXPOSURE	213	1.00	5.00	4	3.60	0.94
CONFIDENCE	213	1.00	5.00	4	3.60	1.00
COMPETITORS	213	1.00	5.00	4	3.54	0.94
SUPPORT	213	1.00	5.00	2	2.60	1.05
VIABILITY	213	1.00	5.00	2	2.89	1.03
TIME	213	1.00	5.00	4	3.28	1.09
OPPORTUNITIES	213	1.00	5.00	4	3.49	0.92
DISTANCE	213	1.00	5.00	4	2.99	1.13
UTILITIES	213	1.00	5.00	4	3.68	0.92

GOVERNMENT	213	1.00	5.00	2	2.66	1.08

Source: Processed Primary Data (2021)

4.5.2. Normality, Linearity, and Homoscedasticity

Histogram, Q-Q plot, and statistical normality tests are used to determine the normality of residuals. These tests show that the normality assumption is met. The model met the linearity assumption to a large extent. As a result, this regression model's coefficients and standard errors are reliable for making predictions and testing hypotheses. Square-rooted Standard Residuals against Fitted Values plot and two statistical tests (Studentized Breusch-pagan test and White test) are used to test for homoscedasticity of residuals in the regression model. The model nearly matched the homoscedastic assumption. As a result, this regression model's coefficients and standard errors are reliable for making predictions and hypothesis testing.

4.5.3. Multicollinearity

The Variance Inflation Factor (VIF) tests multicollinearity using R software. As shown in *Table 8*, VIF values for the regression model met the multicollinearity condition successfully. Therefore, this regression model's coefficients and standard errors are reliable for making predictions and hypothesis testing.

Table 8: Variance Inflation Factor (VIF) Result of Regression Model

Variable Code	**VIF Value**
FEAR	1.476384
FAMILY	1.643704
COST	1.315675
KNOWLEDGE	1.469592
SKILLS	1.655397
PRACTICAL	1.834193
EXPOSURE	1.686743
CONFIDENCE	1.708063
COMPETITORS	1.544113
SUPPORT	1.784567
VIABILITY	1.427247
TIME	1.721588
OPPORTUNITIES	1.514408
DISTANCE	1.450776
UTILITIES	1.585443
GOVERNMENT	1.787318

Source: Processed Primary Data (2021)

Note: Variance inflation factor value starts from one. The rule of thumb for the variance inflation factor is as follows: a value of 1 indicates that the variables are not correlated, and a value between 1 and 5 indicates that they are moderately correlated. A value greater than 5 indicates that they are highly correlated—the VIF values for this regression model range from 1 to 1.8. As a result, the regression model meets the multicollinearity *assumption.*

4.5.4. Multiple Linear Regression Results

The mean value of Entrepreneurial Intention was found to be 1.98, indicating that respondents have a significant desire to engage in entrepreneurial activity. According to *Table 9*, the adjusted R^2 value for the regression model is 0.3428, indicating that this model accounts for 34.28 percent of Entrepreneurial Intention. The low p-value (less than 3.419 x 10-13) and low F-statistic value (7.423) indicate the overall high significance of the model's results.

The residuals have a normal distribution, with roughly similar minimum and maximum values (-1.02602 and 1.00154) and a close to zero median value (-0.00557).

Two independent variables' t-values and p-values reveal a statistically significant impact on Entrepreneurial Intention. CONFIDENCE, one of the two independent variables, is statistically significant in the 99% confidence range. Entrepreneurial intention will drop by 19% for the participants who have no confidence in their business idea, assuming all other variables remain constant. PRACTICAL is the other significant independent variable. In the 95% confidence interval, it exhibits statistical significance. Entrepreneurial intention will drop by approximately 10% for participants who do not know the necessary practical elements to start a business, assuming all other variables remain constant.

Table 9: Regression Results of the Model

Residuals:				
Min	1Q	Median	3Q	Max
-1.02602	-0.15016	-0.00557	0.14390	1.00154
Coefficients	**Estimate**	**Std. Error**	**t value**	**Pr(>|t|)**
(Intercept)	2.985160	0.168163	17.752	< 0.0000000000000002 ***
FEAR	0.033454	0.023251	1.439	0.15192
FAMILY	0.013945	0.028644	0.487	0.62696
COST	-0.039023	0.024227	-1.611	0.10899
KNOWLEDGE	-0.012189	0.026546	-0.459	0.64665
SKILLS	-0.004257	0.030401	-0.140	0.88880
PRACTICAL	-0.099751	0.031736	-3.143	0.00195 **
EXPOSURE	-0.009303	0.030295	-0.307	0.75914
CONFIDENCE	-0.190008	0.028357	-6.701	0.000000000254 ***
COMPETITORS	-0.010452	0.028964	-0.361	0.71861
SUPPORT	0.047101	0.027208	1.731	0.08514.
VIABILITY	0.021410	0.024676	0.868	0.38673
TIME	0.006069	0.026047	0.233	0.81602
OPPORTUNITIES	-0.007099	0.029176	-0.243	0.80805
DISTANCE	-0.015245	0.023139	-0.659	0.51084
UTILITIES	0.016893	0.030712	0.550	0.58296
GOVERNMENT	-0.039858	0.026332	-1.514	0.13185
Residual standard error: 0.3013 on 181 degrees of freedom				
Multiple R-squared: 0.3962, Adjusted R-squared: 0.3428				
F-statistic: 7.423 on 16 and 181 DF, p-value: 0.0000000000003419				

Source: Processed Primary Data (2021)

Note: Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

5. Conclusion & Recommendations

According to this study's Hypothesis 01(H1), none of the demographic variables statistically impact entrepreneurial intention except for marital status. Also, there is a statistically significant difference in the Entrepreneurial Intention of widows compared to married and unmarried women. Therefore, it is essential to study further the problems that widows face compared to married and unmarried women when starting entrepreneurial activities. For Hypothesis 02(H2), It is observed that only two barriers have a statistically significant negative impact on entrepreneurial intention. Those two barriers are a lack of confidence in the business idea (CONFIDENCE) and a lack of necessary practical details to start a business (PRACTICAL). Accordingly, the following recommendations are helpful to develop rural women's entrepreneurship.

5.1 Recommendations

Expanding business counselling services, financial literacy programs, business mentoring schemes, and providing information and advice on how to start a business, how to do good bookkeeping, how to prepare business plans, and other topics will have strong catalytic effects on enhancing women's entrepreneurship, particularly in areas where women entrepreneurs have limited access to networks of other women entrepreneurs. Which will boost confidence and information among them.

Introducing role models and success stories to the participants will improve the practical business skills among rural women and support improving their positive attitude towards initiating entrepreneurial activities.

The government can partner with business clusters formed by women entrepreneurs to secure them even when there are downfalls. These partnerships will lessen the fear of failure among women, and they will be encouraged in entrepreneurial start-ups. A Procurement Preference Policy might be adopted to help rural women entrepreneurs gain a more significant proportion of government contracts. Also, the government can promote business relationships between large enterprises and women entrepreneurs through buyer-seller meetings, buy-back, and subcontracting agreements to maintain a steady market for women entrepreneurs.

6. Directions for Future Research

As a finding of this study, the marital status of these women significantly impacts their entrepreneurial intention. Therefore, an in-depth qualitative analysis of this is recommended for future research.

Finally, a detailed investigation into the exact nature and type of variables that affect the rural women's entrepreneurship development process at various positions on the entrepreneurship ladder will aid in developing more effective government policies related to rural women's entrepreneurship development.

Author Contributions: All authors contributed to this research.

Funding: Not applicable.

Conflict of Interest: The authors declare no conflict of interest.

Informed Consent Statement/Ethics Approval: Not applicable.

References

Ahmed, M. (2020). *Exploring Entrepreneurial Intentions among University Students in Bangladesh* [Master Thesis, Kajaani University of Applied Science]. THESEUS Open Repository. https://www.theseus.fi/handle/10024/355809

Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Process*, 50(2), 179–211.https://doi.org/10.1016/0749-5978(91)90020-T

Bakri, M., Bizri, R.M., Dani, A., Kojok, A., and Mokahal, M. (2012). Barriers to Entrepreneurial Endeavors in a Developing Economy. *World Journal of Social Sciences*, 2(6): 79-100. https://www.researchgate.net/publication/236948982_Barriers_to_Entrepreneurial_Endeavors_in_a_Developing_Economy

Bird, B., & Jelinek, M. (1998). The Operation of Entrepreneurial Intentions. *Entrepreneurial Theory and practice*, 21-29. DOI: 10.1177/104225878801300205

Camelo-Ordaz, C., Diánez-González, J. P., & Ruiz-Navarro, J. (2016). The influence of gender on entrepreneurial intention: the mediating role of perceptual factors. *Business Research Quarterly,*19(4),261–277. https://doi.org/10.1016/j.brq.2016.03.001

Carsrud, A. & Krueger, N. (1993). Entrepreneurial intentions: Applying the theory of planned behavior. *Entrepreneurship and Regional Development*, 5(4), 315–330. http://dx.doi.org/10.1080/08985629300000020

Carsrud, A.L., Krueger, N.F., & Reilly, M.D. (2000). Competing models of entrepreneurial intentions. *Journal of Business Venturing*, 15(5–6), 411–432. https://doi.org/10.1016/S0883-9026(98)00033-0

Department of Census and Statistics, Sri Lanka. (2019). Household *Income and Expenditure Survey-2019: Final Result*

Department of Census and Statistics, Sri Lanka. (2020). *Sri Lanka Labour Force Survey: Annual Report 2020*

Department of Census and Statistics, Sri Lanka. (2022). *Poverty Indicators- 2019*

Department of Rural Development, North Western Province, Sri Lanka. (2019). *Annual Progress Report 2018*

Dutta, K. D., & Thornhill, S. L. (2008). The evolution of growth intentions: Toward a cognition-based model. *Journal of Business Venturing, 23*, 307-332. http://dx.doi.org/10.1016/j.jbusvent.2007.02.003

Fallah-Jelodar, R., Hosseini, S.J.F., Hosseini, S.M., and Mirdamadi, S.M. (2007). Factor affecting to the success of rural women's entrepreneurship in north of Iran. *Village and Development*, 10(4): 87–116. https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwjq2ZSw6PqDAxU1zTgGHbcRDTAQFnoECA8QAQ&url=http%3A%2F%2Frvt.agriperi.ac.ir%2Farticle_59292.html%3Flang%3Den&usg=AOvVaw1XbOYCAqL2Ov94r9HzMbBj&opi=89978449

Farani, A.Y., & Movahedi, R. (2012). Analysis of the barriers and limitations for the development of rural women's entrepreneurship. *International Journal of Entrepreneurship and Small Business,* 15(4), 469-487. http://dx.doi.org/10.1504/IJESB.2012.046476

Franke, N. & Lüthje, C. (2003). The "making" of an entrepreneur: Testing a model of entrepreneurial intent among engineering students at MIT. *Research and Development Management,* 33(2), 135–147. https://doi.org/10.1111/1467-9310.00288

Glass, A., Jacuk, L., and Shragg, P. (1992). Study of barriers facing Albertan women in business. *Journal of Small Business and Entrepreneurship,* 9(4), 40–49.

Hechavarría, D.M., & Ingram, A.E. (2018). Entrepreneurial ecosystem conditions and gendered national-level entrepreneurial activity: a 14-year panel study of GEM. *Small Business Economics,* 53(2), 431–458. https://doi.org/10.1007/s11187-018-9994-7

Huefner, J., Hunt, H.K., Robinson, P.B., and Stimpson D.V. (1991). An attitude approach to the prediction of entrepreneurship. *Entrepreneurship Theory and Practice*, 15(4),13–31. http://dx.doi.org/10.1177/104225879101500405

Jahangiri, J., Khajenoori, B., and Lahsayezadeh, A. (2006). Determining economic share of rural women: caste study in Fars province. *Quarterly of Iran's Sociology, 6*(3), 124–145.

Kaur, S. & Sidhu, K. (2006). Development of entrepreneurship among rural women. *Journal of Social Science*, *13*(2), 147–149. https://doi.org/10.1080/09718923.2006.11892543

Krueger, N. (1993). The impact of prior entrepreneurial exposure on perceptions of new venture feasibility and desirability. *Entrepreneurship Theory and Practice*, 18(1), 5–21. http://dx.doi.org/10.1177/104225879301800101

Meyer, N. (2009). *An Investigation into the Determinants of Women Entrepreneurship* [Master thesis, North-West University]. Boloka Institutional Repository. http://repository.nwu.ac.za/handle/10394/4749

Pallant, J. (2013). *SPSS - Survival Manual - A step by step guide to data analysis using IBM SPSS*. Berkshire: McGraw Hill.

Pruett, M., Shinnar, R.S., & Toney, B. (2009). Entrepreneurship education: Attitudes across campus. *Journal of Education for Business, 84*(3), 151–159. http://dx.doi.org/10.3200/JOEB.84.3.151-159

Reynolds, P.D., Autio, E., & Hechavarria, D.M. (2008). *Global Entrepreneurship Monitor (GEM): Expert Questionnaire Data, 1999-2003 Codebook and Data Set Description.* Inter-university Consortium for Political and Social Research. https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwjFt6Pl8PqDAxVzzTgGHRacAJwQFnoECBYQAQ&url=https%3A%2F%2Fwww.researchgate.net%2Fprofile%2FPaul-Reynolds-5%2Fpublication%2F309122329_Global_Entrepreneurship_Monitor_GEMExpert_Questionnaire_Data_1999-2003_ICPSR_21862%2Flinks%2F57ffd8d008ae32ca2f5db3e1%2FGlobal-Entrepreneurship-Monitor-GEMExpert-Questionnaire-Data-1999-2003-ICPSR-21862.pdf%3Forigin%3Dpublication_list&usg=AOvVaw1-uXJ_3ITcpzNNnTf7dfOe&opi=89978449

Shahhosseini, A. (2008) Entrepreneurship, 2nd ed., Aeejh Publication, Tehran.

Shapero A. (1982). Social Dimensions of Entrepreneurship. In C. Kent, D. Sexton and K. Vesper, eds., The Encyclopedia of Entrepreneurship. Englewood Cliffs: Prentice-Hall.

Shrestha, N. (2021). Factor Analysis as a Tool for Survey Analysis. *American Journal of Applied Mathematics and Statistics, 9*(1), 4-11. DOI: 10.12691/ajams-9-1-2

Linder, C., & Sperber, S. (2019). Gender-specifics in start-up strategies and the role of the entrepreneurial ecosystem. *Small Business Economics*, 53(2), 533-546. DOI: 10.1007/s11187-018-9999-2.

Thompson, E. R. (2009). Individual Entrepreneurial Intent: Construct Clarification and Development of an Internationally Reliable Metric. *Entrepreneurship Theory and Practice, 33*(3), 669-694. https://doi.org/10.1111/j.1540-6520.2009.00321.

Wagner, J. (2007).What a Difference a Y makes-Female and Male Nascent Entrepreneurs in Germany. *Small Business Economics, 28,* 1–21. DOI: 10.1007/s11187-005-0259-x.

Why the world needs women entrepreneurs. (2013, November 18). *The Economist*. https://www.economist.com/news/2013/11/18/why-the-world-needs-women-entrepreneurs

World Economic Forum. (2013). *Entrepreneurial ecosystems around the globe and company growthdynamics*.http://www3.weforum.org/docs/WEF_EntrepreneurialEcosystems_Report_2013.pdf

Li, Y., Wu, J., & Zhang, D. (2019). Identifying women's entrepreneurial barriers and empowering female entrepreneurship worldwide: a fuzzy-set QCA approach. *International Entrepreneurship and Management Journal, 15(3),* 905–928. DOI:10.1007/s11365-019-00570-z.

Zwan, P.V.D., Verheul, I., & Thurik, A.R. (2012). The entrepreneurial ladder, gender, and regionaldevelopment. *Small Business Economics, 39(3)*, 627-643. DOI:10.1007/s11187- 011-9334-7.

The Asian Institute of Research
Economics and Business Quarterly Reviews
Vol.7, No.1, 2024: 72-84
ISSN 2775-9237

DOI: 10.31014/aior.1992.07.01.560

An Empirical Study on the Effect of Credit Concentration on DSE Listed Banks' Risk and Return

Al Hasan[1], Mithun Chokroborty[2]

[1] Faculty Grade - 5, Bangladesh Academy for Securities Markets
[2] Faculty Grade - 5, Bangladesh Academy for Securities Markets

Abstract
This study makes an endeavor to experimentally find out the impact of credit concentration on DSE (Dhaka Stock Exchange) listed banks' risk and return. Banking industry in Bangladesh is going through a turbulent situation due to increase in the size of NPL (Non-Performing Loan) which undermines banks' profitability. The objective of this paper is to assess the impact of credit concentration on banks' risk and return. We took Hirshmann-Herfindahl Index to measure the portfolio concentration, RoE (Return on Equity) as measurement of banks' return and NPL (Non-Performing Loan) as measurement of banks risk. In this report we have collected data of five DSE (Dhaka Stock Exchange) listed private commercial banks from 2014 to 2018. We found that the concentration is highest in manufacturing, trade finance and readymade garments sector. Of the total loan portfolio of five banks from 2014 to 2018, 34% is concentrated in manufacturing sector, 19% is concentrated in trade finance, and 18% is concentrated in RMG (Ready Made Garments). The banks have lowest concentration in agricultural sector 2% of its total loan portfolio is given to agricultural sector on average during the period of study. Although concentration in SME (Small and Medium-sized Enterprises) sector, one of the most promising sectors in our country, is increasing but even then the portfolio concentration in SME sector is barely 8%. We regressed the concentration measure on banks NPL (Non-Performing Loan) and ROE (Return on Equity). The major findings we got are bank's return and loan concentration is inversely related and this relationship is established at 5% significance level. However, insignificant relationship is found between loan concentration and NPL (Non-Performing Loan). The recommendations for the banking sector are banks should diversify their portfolio as it would yield more return for the shareholders' of the banks, more extensive study is required to establish the relation between NPL(Non-Performing Loan) and loan concentration, bank should increase its size of portfolio in the SME (Small and Medium-sized Enterprises) sector which is a promising sector for an emerging economy, and banks should try to reduce their loan concentration to the optimum level for RMG (Ready Made Garments), trade finance and manufacturing industry.

Keywords: Credit Concentration, DSE Banks, Risk and Return

1. Background

This study assesses empirically whether banks operating within the banking system in Bangladesh concentrate or diversify their credit portfolio and how this choice impacts their performance and risk. Several countries possess a set of rules limiting a bank's exposure to one single borrower, which is considered an argument in favor of the

necessity of diversification. In contrast, there are many banks that decide to specialize their loans activities to sectors in which they enjoy comparative advantage.
Traditional banking theory argues that banks should diversify their credit portfolio, given that through the expansion of their credit lines to new sectors, the bank's probability of default will be reduced. The idea is that due to asymmetric information, diversification reduces financial intermediation costs. Moreover, less diversified banks would be more vulnerable to economic downturns, since they are exposed to few sectors. Many banking crises in past were caused by, among other reasons, concentration in bank's loan portfolios, which supports the view that risk is highly associated with this strategy. When the risks are low, banks may benefit more from specialization than from diversifying, since there is a low probability of failure.

Employing different measures as proxies of loan portfolio concentration, our primary goal is to identify the influence of loan concentration on Bangladeshi banks return. After that, we also observe how risks, interacted with concentration measures. Finally, we estimate the impact of loan concentration on bank's risk, which indicate whether the banks' monitoring decisions are effective or not.

1.1. Objective of the study

The objective of this strategy is to determine the impact of loan concentration on banks' risk and return.
In determining the loan concentration's impact on banks return we will use the following hypothesis.
H_0: There is no relationship between loan concentration and bank's return
H_1: There is significant relationship between loan concentration and bank's return
In case of determining the effect of loan concentration on banks' risk we will use the following hypothesis
H_0: There is no relationship between loan concentration and bank's risk
H_1: There is significant relationship between loan concentration and bank's return.

2. Methodology of the Study

2.1. Nature of the study

The report is titled "An Empirical Study on the Effect of Credit Concentration on DSE Listed Banks' Risk and Return". This particular report will conducted quantitative analysis to determine the effect of loan concentration on banks risk and return.

2.2. Sources of Data

The primary source of data used for this report is the annual reports of the banks under study.

2.3. Population Size

The population size of the study would be the total numbers of schedule banks listed in Dhaka Stock Exchange. The total number of schedule bank listed in Dhaka Stock Exchange that takes their license from the central bank is considered as the total population of the study. The non-scheduled bank is not considered as the subject of study in this regard.

2.4. Sample size

The sample size of our study is 5 schedule banks listed in Dhaka Stock Exchange. The time frame of the study would be from year 2014 - 2018. The private commercial banks are chosen to avoid any result complication that might be present due to any differences in ownership structure.

2.5. Sampling Design

In this study, we have used convenience sampling. Therefore, we have collected the data for those banks whose data are easily available.

2.6. Sample type

We used panel data for the purpose of our study. The panel data sample of five banks for the last five years gives us 25 numbers of observations. The panel data is used to ensure that the result of this study gives us a reliable result.

2.7. Variables used

The variables used to as proxy of return is *ROE (Return on Equity),* it is the ratio of net income to total shareholders' equity. It is used as proxy of return because this ratio shows how much return the entrepreneur of the banks' has generated using their investment.

The variable use as proxy of risk is the *NPL (Non-Performing Loan) ratio;* it is the ratio of total non-performing loans to the total outstanding loans and advances. It is used as a proxy for banks' return because the main asset of any bank is its loan and advances and if any loan becomes non-performing it is a matter of grave concern for banks' profitability and increase in the NPL ratio represents an increase in banks' risk.

2.8. Concentration Measures

As proxies of concentration, we consider, in this study, one traditional concentration measures the Hirshmann-Herfindahl Index (HHI). It is important to highlight that the object of our analysis is the composition of the industrial sector in the bank's loan portfolio, i.e. the bank's relative exposures to the different industries. Thus, the concentration measures will be used to estimate and verify the effect of loan concentration in one or more economic sector on banks' returns.

Before illustrating how the concentration measures are calculated, we define relative exposure (*ri*) of the bank *b* at time *t* to each economic sector *i* as:

$$ri = \frac{Nominal\ Exposure_{bti}}{Total\ Exposure_{bti}}$$

The HHI, i.e. the sum of the squares of the relative exposures, has been one the most known concentration measure in industrial organization and in the studies about this matter, due to its relatively simplicity. The HHI of bank *b* at time *t* can be defined as:

$$HHI = \sum_{i=1}^{n} r_i^2$$

Note that the inferior limit of the HHI is $\frac{1}{n}$ and represents a perfect diversified portfolio, meaning an equal share of exposure to each sector *n*. On the other hand, if the HHI is equal to 1, all loans are handed out to only one industry, i.e. a perfect specialization scenario. An advantage of this index is that the higher its value, the higher the concentration**.**

For the purpose of our study we selected 13 sectors where the loan is provided. So, in our case the inferior limit of the HHI is 0.08 which represents a perfectly diversified portfolio and 1 represent an extremely concentrated portfolio.

2.8.1. The relationships between banks return and loan portfolio concentration

The most basic question regarding to this topic is whether loan portfolio concentration results in higher returns. It can be answered by regressing returns on a concentration measure, as in the following regression:

$$ROE_t = \beta_0 + \beta_1 . CM_t + \epsilon_t$$

where ROE_t is the return of bank at time t measured by the Return on Equity. CM_t *(Concentration Measure)* represents, separately, the concentration measures of bank at time *t.*

2.8.2. The relationship between banks risk and loan portfolio concentration

Another slope of our analysis takes into account the relationship between concentration and risk. For this purpose, we employ the natural logarithm of the the Non-Performing Loans. Then, the main idea is to regress this variable on CM_t.

$$NPL_t = \alpha_0 + \alpha_1 CM_t + \varepsilon_t$$

where NPL_t is the risk measure of bank at time t which turns into bad asset. CM_t represents, separately, the concentration measures explained before of bank at time *t.*

3. Literature Review

Traditional banking theory argues that banks should diversify their credit portfolio, given that through the expansion of their credit lines to new sectors, the bank's probability of default will be reduced (Diamond, 1984). The idea is that due to asymmetric information, diversification reduces financial intermediation costs. Moreover, less diversified banks would be more vulnerable to economic downturns, since they are exposed to few sectors. Many banking crises in the last 25 years were caused by, among other reasons, concentration in bank's loan portfolios, which supports the view that risk is highly associated with this strategy (BIS, 1991). This view is also empirically supported by Argentinean banks on the Argentinean financial crisis of 2001 and 2002 (Bebczuk and Galindo, 2008) and by Austrian banks over the years 1997-2003 (Rossi et al., 2009). On the other hand, the theory of corporate finance supports the idea that firms should concentrate their activities on a specific sector or group of sectors to take benefits of expertise in how business are done in these sectors (Jensen, 1986; Denis et al., 1997; Meyer and Yeager, 2001; Stomper, 2004; Acharya et al., 2006). Another argument against portfolio diversification is that it can also result in increasing competition with other banks, making this strategy less attractive. In particular, Winton (1999) defends that diversification only reduces the chances of bank failure in the case of moderated risks of default. When the risks are low, banks may benefit more from specialization than from diversifying, since there is a low probability of failure. Conversely, when the probabilities of insolvency are high, diversification may even worsen the situation, since the bank will be exposed to many sectors, and the downturn of one may be enough to lead this bank to bankruptcy. Furthermore, there is also empirical evidence that diversification increases the risk in the Italian banking sector (Acharya et al., 2006) and in the German banking sector (Kamp et al., 2006) and diversification reduces the performances of the banks in the Chinese banking sector (Berger et al., 2010) and in the German banking sector (Norden and Szerencses, 2005; Hayden et al., 2007). Independently from these two main views, Kamp et al. (2007) show that neither of the theories mentioned above are completely right for the entire German banking sector in the period from 1993 to 2003. They find that the main benefit of diversifying credit portfolios is the achievement of relative lower levels of risk compared to concentrated portfolios. The returns of concentrated portfolios, however, seem to be higher than those of diversified banks. The authors conclude that the typical risk-return trade-off appears to be the solution of this analysis, leaving banks to choose their own strategy in order to maximize their performance.

It is worth mentioning that most of the studies published about this matter so far focus their attention in the banking sectors of developed countries, such as the U.S. and Germany. With the exception of Bebczuk and Galindo (2008) and Berger et al. (2010), there is a lack of evidence and discussion regarding the effects of the loan portfolio composition on banks of emerging economies. Given the uniqueness of their economic conditions, the results may be different from those observed in developed countries. This article contributes to the literature by proposing to examine the effects of loan portfolio strategies on the performance of Banks operating in Bangladesh.

4. Loan Concentration Scenario of Different Banks in Study

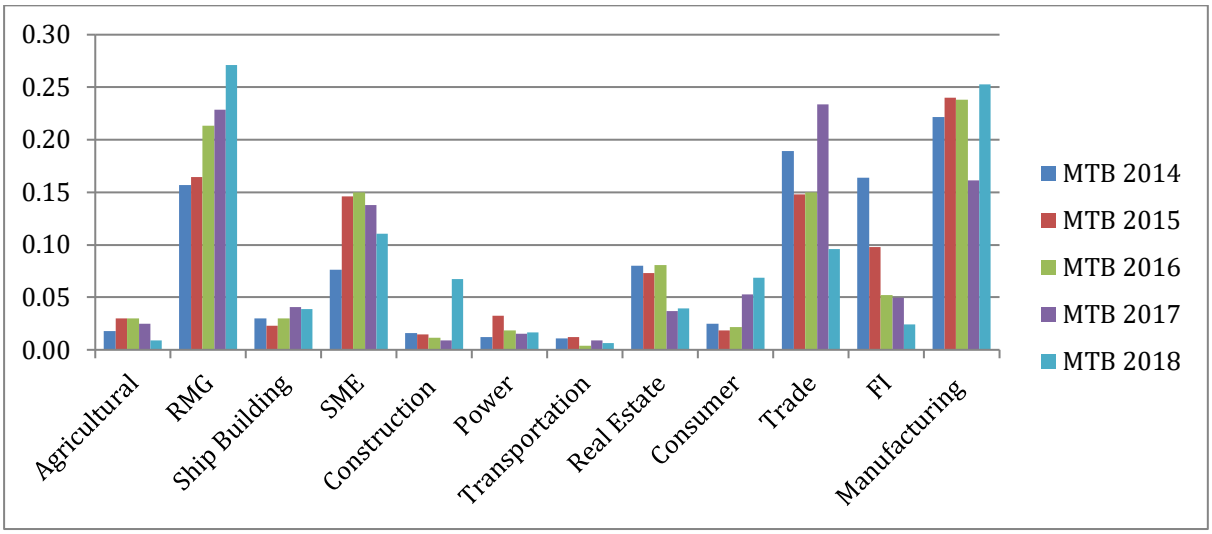


Figure 1: Loan concentration Scenario of MTB (Mutual Trust Bank Ltd.) from 2014-2018.

The table above shows the loan concentration scenario of MTB from the year 2014 to 2018. The bank is focusing largely on manufacturing industry other than trade and RMG in 2014 and 2015. However, from the year 2016 to 2018 the focus largely is directed towards the RMG sector with 23% of its loan portfolio going to the RMG sector in year 2017 and 27% in 2018.

The concentration towards the agriculture sector is very minimal ranging from 1% to 3% during the period of study. Moreover, in 2018 the loan concentration in the agricultural sector is barely 1% of its total loan portfolio.

In 2016 the bank provides 16% of its total loan which is highest concentration in this sector in the last 5 year. However, the concentration in this sector is decline for the last two years for MTB.

In trade the concentration is highest in 2017 around 23%. In construction, power and transportation sector the loan concentration is 7%, 2% and 1% respectively.

The concentration in the ship building industry is around 3-5% for the last 5 years. The concentration in the consumer sector is showing a rising trend. MTB recently is increasing its focus in consumer financing.

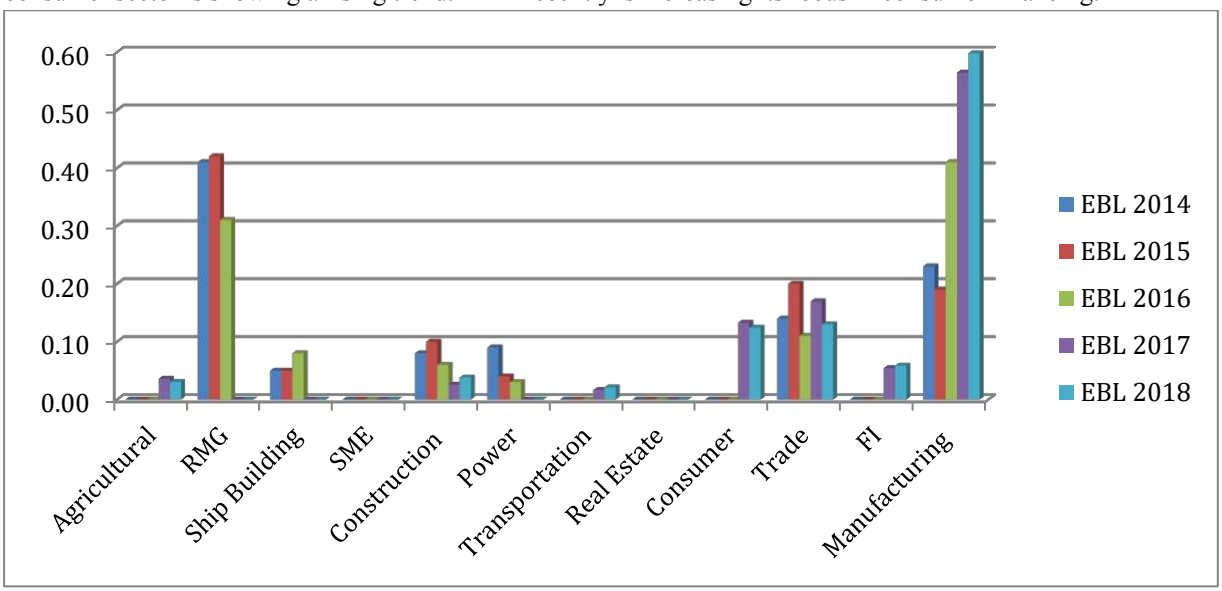


Figure 2: Loan concentration Scenario of EBL (Eastern Bank Ltd.) from 2014-2018

Agricultural loan concentration of EBL is on 4% and 3% in 2017 and 2108 respectively.

The bank's loan is highly concentrated in RMG sector. The bank has 42% loan concentration in RMG sector in 2015. The bank has 4% loan portfolio concentration in construction sector. The loan concentration in the power sector is declining the concentration is 9% in 2014 which reduced to 3% in 2016.

EBL's concentration in transportation and real estate is bare minimum. The bank is focusing in consumer sector the loan concentration in consumer sector is 13% and 12% of the loan portfolio in 2017 and 2018 respectively.

In trade sector the loan concentration is around 15%-20% during the period of study. The bank is focused in trade finance.

EBL's concentration in ship building industry is around 5%-8% during the period of study. The bank has bare minimum focus in SME sector. EBL's loan concentration in manufacturing sector other than RMG sector is showing an increasing trend. In 2014 the concentration in this sector is 23% whereas it rose to 60% concentration in 2018.

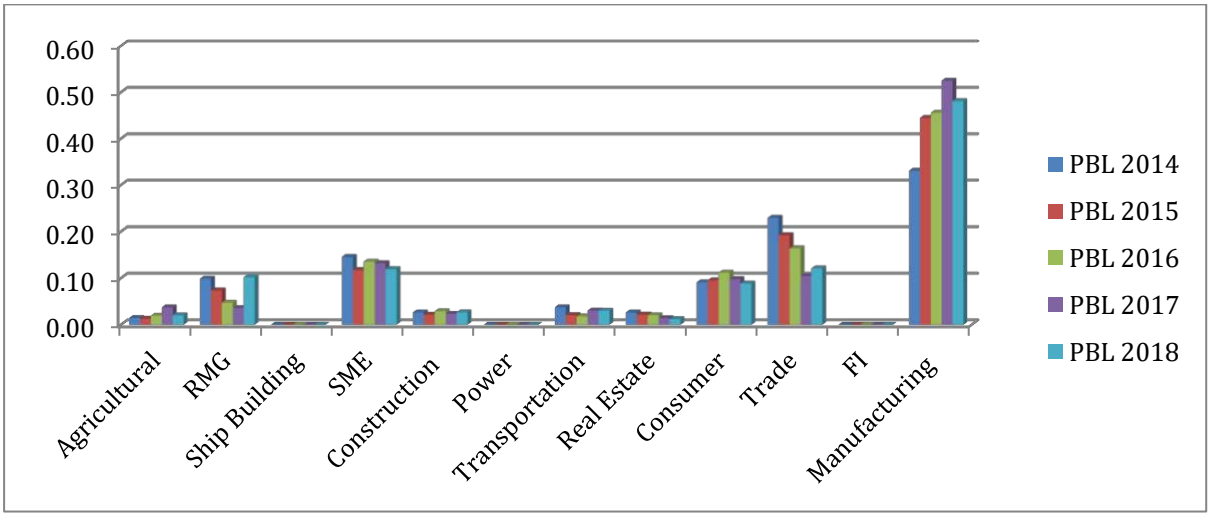


Figure 3: Loan concentration Scenario of PBL (Prime Bank Ltd.) from 2014-2018

PBL is focusing mainly in RMG, SME, consumer, trade and manufacturing sector.

The loan concentration in agricultural sector is around 2%-4% during the period of study. The banks focus in the RMG sector is increasing recently. In 2018 the loan concentration in this sector is 10% whereas in 2017 the concentration in this sector is 4%.

The concentration in the SME sector of PBL is quite stable and the bank is trying to increase its portfolio concentration in this sector. PBL's SME concentration is around 12%-15% during the period of study.

The loan concentration in the concentration sector is around 3% during the period of study. The bank is less focused in the power sector. The concentration in the transportation and real estate sector is around 2%-3% during the period of study.

PBL's consumer financing concentration is around 9%-10% during the period of study. The bank is increasing its focus in consumer finance recently.

PBL's trade finance concentration is showing declining trend. In 2014, the concentration in this sector is 23% whereas it reduced to 12% in 2018. PBL's concentration in the manufacturing industry is showing an uptrend. Its loan concentration in this sector is 33% in 2014 and it increased to 48% in the year 2018.

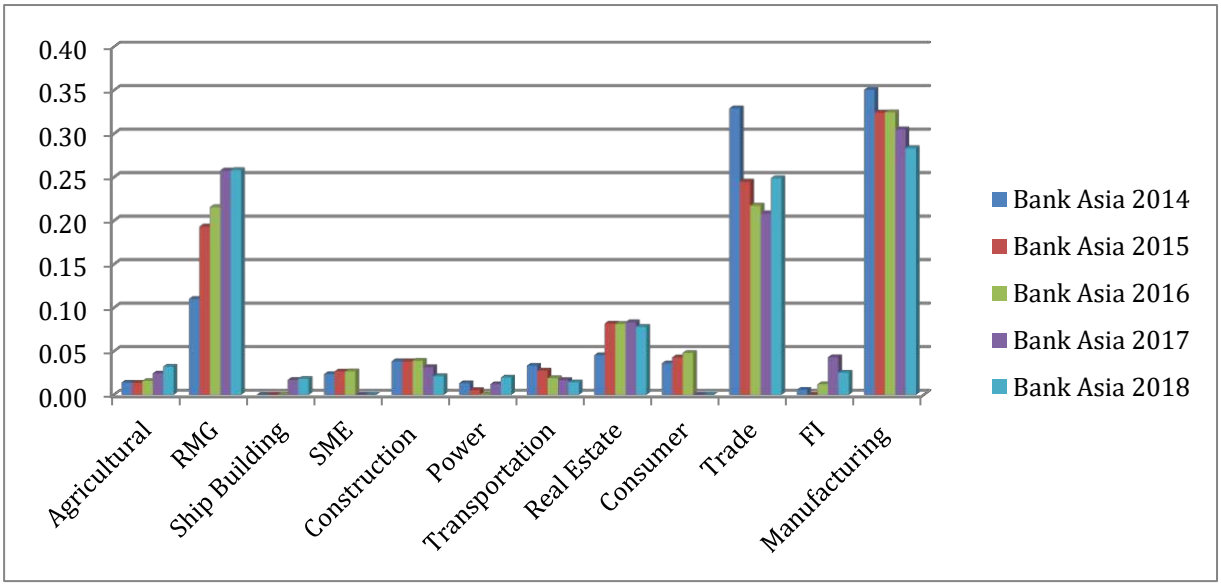


Figure 4: Loan concentration Scenario of Bank Asia Ltd. from 2014-2018

Bank Asia's agricultural concentration is increasing but the concentration is minimal. The loan concentration in agricultural sector is 3% in 2018.

Bank Asia's stake in the RMG sector is showing an upward trend. The concentration in the RMG sector is 26% in year 2018 whereas it is only 11% in the year 2014.

The concentration in the SME sector is only 3% in 2017. The concentration in the construction sector is declining and is only 2% is in 2018. Concentration in the power in power and transportation sector is around 2% lately.

The concentration in the real estate is only 8% during the period of study and concentration in this sector is quite stable.

In consumer financing the banks concentration is around 5%.
Major focus of Bank Asia is in trade finance and manufacturing industry; however, the concentration in the trade finance sector is representing a declining trend. The concentration in this sector is 33% in the year 2014 whereas it reduced to 25% in the year 2018.

The concentration in the manufacturing industry is also showing a downward trend in the past five years. The concentration is 35% in 2014 which reduced to 28% in 2018.

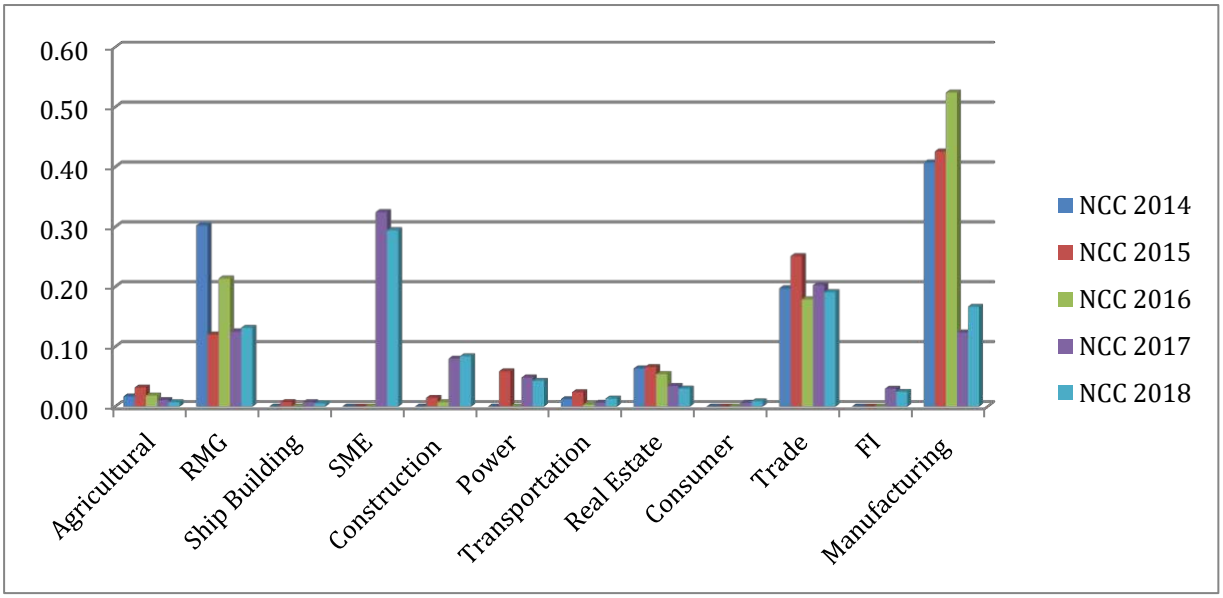


Figure 5: Loan concentration Scenario of NCC Bank Ltd. from 2014-2018

NCC bank's agricultural sector concentration is very minimal. In the year 2018 its concentration in the agricultural sector is barely 1%.

Concentration in the RMG sector is showing a declining trend. The concentration is 30% in 2014 which reduced to 13% in 2014.

The concentration in the SME shows a high rise jump in year 2017 and 2018. The concentration is 32% in 2017 and 29% in 2018.

The concentration in construction sector is 8% in year 2017 and 2018. In power sector the concentration is around 4%-6% during the period of study. In transportation sector the concentration is barely 1% in 2018. In real estate sector the concentration is 7% in year 2015 which reduced to 3% in 2018.

The concentration in the trade finance is stable during the period of study. The concentration is about 20% during the period of study. The highest concentration in this sector is in year 2015 with concertation of 25% in this sector.

NCC bank is highly concentrated in manufacturing industry. However, the concentration drastically falls from 52% to 17% from year 2016 to 2017. In 2014 the concentration in this sector 41% and 17% in 2018.

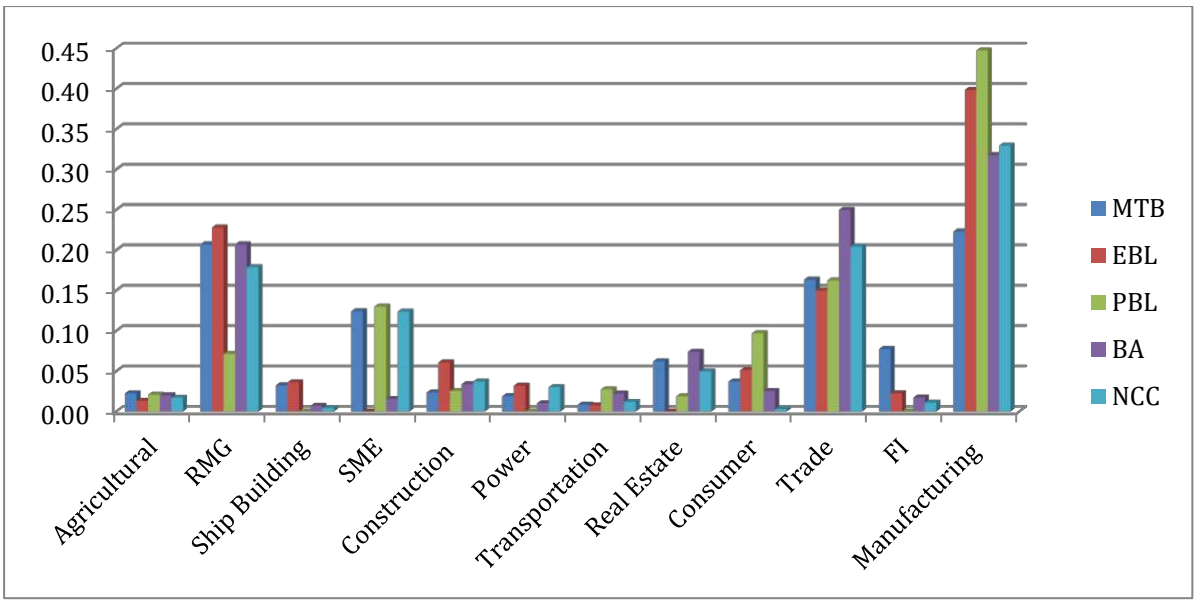


Figure 6: Average loan concentration of selected 5 PCBs (Private Commercial Banks) from 2014-2018

In the figure above we can see that all banks except EBL is providing 2% of their loan portfolio to the agricultural sector. EBL concentration is 1% on average in this sector during the period of study.

In RMG sector EBL has highest concentration on average about 23% of its loan portfolio goes to this sector. The MTB and Bank Asia provide 21% of their loan portfolio on average to RMG sector. PBL and NCC provide 7% and 18% of their loan portfolio on average to RMG sector.

EBL has highest concentration on average on ship building industry among the banks which is only 4% of its total loan portfolio on average during the period of study.

PBL, MTB, and NCC banks have focused concentration on SME business among the five banks. The concertation is 13%, 12% and 12% respectively of their total loan portfolio on average during the period of study.

In construction and power sector EBL has highest concentration among the banks. The average concentration in construction and power sector is 6% and 3% during the period of study. In real estate sector Bank Asia is providing the most among the banks which is 7% of its loan portfolio during the period of study.

In consumer financing PBL is focusing recently very much and the average concentration of PBL in consumer financing is about 10% of its total loan portfolio during the period of study.

In trade finance Bank Asia has the highest concentration among the banks during the period of study. 25% of Bank Asia loan portfolio is concentrated in this sector.

In financing manufacturing industry PBL and EBL have shown highest concentration among the studied five banks their concentration in manufacturing industry is 45% and 40% respectively during the period of study.

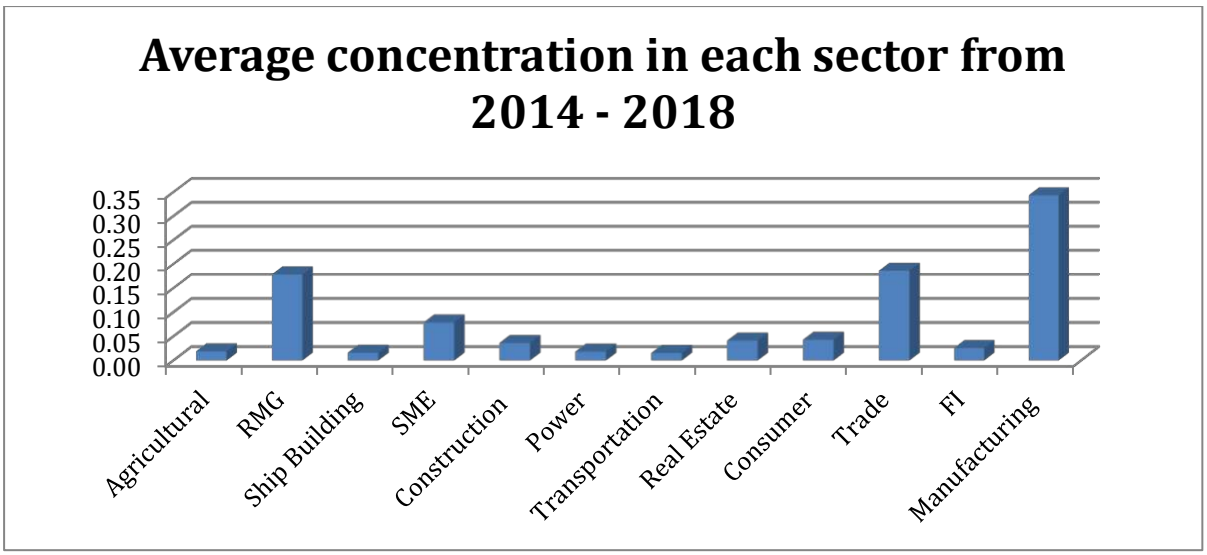


Figure 7: Average concentration in each sector during the period of study (of 5 PCBs studied)

In the figure above, we can see that the average concentration is highest in the manufacturing industry with average concentration around 34% of the total loan portfolio. The average concentration in RMG and trade finance is 18% and 19% respectively. The concentration in SME sector is growing lately around 8% of the total loan portfolio during the period of study.

5. Hypothesis Testing

5.1. The relationship between banks returns and loan portfolio concentration

To test the hypothesis here we considered the variable ROE of the banks as the measurement of the return and to measure concentration we used the Hirshmann-Herfindahl Index (HHI). Here to test this hypothesis panel data is used of five commercial banks for the last five years. In determining the loan concentration's impact on banks return we will use the following hypothesis statements:

H_0: There is no relationship between loan concentration and bank's return

H_1: There is significant relationship between loan concentration and bank's return

The econometric model of this theory is:

$$lnROE_t = \beta_0 + \beta_1 . lnCM_t + \epsilon_t$$

The model includes natural logarithm of ROE as dependent variable and natural logarithm of HHI as independent variable. Here, we used natural logarithm because the data are somewhat skewed positively. Therefore, we used natural logarithm of the variables to make sure the data have normal distribution. The model includes error term which represents the impact of other variables on the dependent variable. The error terms represents the sum of the deviations within the regression line.

Table 1: Regression Statistics of loan concentration on banks' return

Regression Statistics	
Multiple R	0.41
R Square	0.17
Adjusted R Square	0.13
Standard Error	0.28
Observations	25

	β	**t Stat**	**P-value**	**F**	**Significance F**

Intercept	-2.84	-9.37	0.00	4.73	0.04
CM[1]	-0.45	-2.18	0.04		

The regression statistics above shows that Multiple R is 41% indicating strong relationship between the ROE and concentration measure (HHI). The R-square is 13% which means that 13% change in ROE is explained or caused by the loan concentration. The coefficient value of β_1 is -0.45 that mean for 1 percentage point increase in loan concentration the ROE would be reduced by -0.45 percentage points. This relationship between ROE and loan concentration is significant at 5% significance level (α). This means increase in loan concentration would negatively affect the return of the bank.

5.2. The relationship between banks risk and loan portfolio concentration

To test the hypothesis here we considered the variable NPL of the banks as the measurement of the risk and to measure concentration we used the Hirshmann-Herfindahl Index (HHI).

Here to test this hypothesis panel data is used of five commercial banks for the last five years.

In determining the loan concentration's impact on banks risk we will use the following hypothesis statements:
H_0: There is no relationship between loan concentration and bank's risk
H_1: There is significant relationship between loan concentration and bank's risk

The econometric model of this theory is:

$$lnNPL_t = \beta_0 + \beta_1 . lnCM_t + \epsilon_t$$

The model includes natural logarithm of NPL as dependent variable and natural logarithm of HHI as independent variable. Here, we used natural logarithm because the data are somewhat skewed. Therefore, we used natural logarithm of the variables to make sure the data have normal distribution. The model includes error term which represents the impact of other variables on the dependent variable (NPL). The error terms represents the sum of the deviations within the regression line.

Table 2: Regression Statistics of loan concentration on banks' risk

Regression Statistics	
Multiple R	0.04
R Square	0.0015
Adjusted R Square	-0.04
Standard Error	0.36
Observations	25

	β	**t Stat**	**P-value**	**F**	**Significance F**
Intercept	-3.25	-9.78	0.00	0.03	0.85
CM(HHI)[2]	-0.04	-0.18	0.86		

The regression statistics above shows that Multiple R is only 4% indicating weak relationship between NPL and concentration measure (HHI). The R-square is 0.15% which means that 0.15% change in NPL is explained or caused by the loan concentration which is also insignificant and we cannot deduce anything from this result. The

[1] Concentration measure shows a significant relationship with ROE at 95% confidence level.
[2] Concentration Measure shows insignificant relationship with NPL. The p-value is 86% in this case.

coefficient value of β_1 is -0.04 that means for 1 percentage point increase in loan concentration the NPL would be reduced by -0.04 percentage points. However, this relationship between NPL and loan concentration is insignificant because the P value is 0.86 which is very high. The significance F value is also very high 0.85. Therefore, on the basis of this study we cannot established any form of relationship between NPL and loan concentration. Here, additional data may be required to established relationship between these variables.

6. Findings

a) Bank's return, ROE, and loan concentration is inversely related.
b) Insignificant relationship between loan concentration and NPL.
c) Loan is mainly concentrated in RMG, trade finance and manufacturing industry.
d) Banks are gradually increasing their concentration in SME.

7. Recommendations

a) Banks should diversify their portfolio as it would yield more return for the shareholders' of the banks.
b) More extensive study is required to establish the relation between NPL and loan concentration.
c) Bank should increase its size of portfolio in the SME sector which is a promising sector for an emerging economy.
d) Banks should try to reduce their loan concentration to the optimum level for RMG, trade finance and manufacturing industry.

8. Conclusion

Banking industry in Bangladesh is comparatively structured and regulated. The sector lately is facing serious problem due to increase in high default loan which undermines the profitability of the banking industry. This paper tries to shed some light on the topic of how the loan portfolio concentration in banking industry may impact its NPL and return. The result seems to support the assumption that concentration negatively affects the bank's return. However, the study is unable to establish any type relationship between NPL and loan concentration. To establish this relation there is a need of more extensive study.

Author Contributions: All authors contributed to this research.

Funding: Not applicable.

Conflict of Interest: The authors declare no conflict of interest.

Informed Consent Statement/Ethics Approval: Not applicable.

References

A. Kamp, A. Pfingsten, A. Behr, and C. Memmel. Diversification and the Banks' Risk-ReturnCharacteristics - Evidence from Loan Portfolios of German Banks. Discussion Paper, Deutsche Bunderbank, 2007.
A. Kamp, A. Pfingsten, and C. Memmel. The winner's curse in lending - evidence from German individual bank portfolios. 2006.
A. Kamp, A. Pfingsten, and D. Porath. Do Banks Diversify Loan Portfolios? A Tentative to Answer Based on Individual Bank Loan Porfolios. Discussion Paper 3, Deutsche Bundersbank, 2005.
A. Meyer and T. Yeager. Are Small Rural Banks Vulnerable to Local Economic Downturns? Technical report, Federal Reserve Bank of St. Louis, Mar 2001.
A. N. Berger, I. Hasan, and M. Zhou. The Effects of Focus versus Diversification on Bank Performance: Evidence from Chinese Banks. *Journal of Banking and Finance*, 34:1417-1435, 2010.
A. Pfingsten and K. Rudolph. German Banks' Loan Portfolio Composition: Market Orientation vs Specialization. Discussion Paper Series DB 02-02, Institut fur Kreditwesen, Munster, 2002.

A. Stomper. A Theory of Banks' Industry Expertise, Market Power and Credit Risk. *Management Science*, 52:1618-1633, 2004.

A. Winton. Don't Put All Your Eggs in One Basket? Diversification and Specialization in Lending. Center for Financial Institutions Working Papers 00-16, Wharton School Center for Financial Institutions, University of Pennsylvania, 1999.

BIS. Measuring and Controlling Large Credit Exposures. *Basel Committee on Banking Supervision, Basel*, 1991.

B. J. G. Bun and J. F. Kiviet. On the Diminishing Returns of Higher Order Terms in Asymptotic Expansions of Bias. *Economic Letters*, 79:145-152, 2003.

D. Denis, D. Denis, and A. Sarin. Agency Problems, Equity Ownership, and Corporate Diversification. *Journal of Finance*, 52:135-160, 1997.

D. Diamond. Financial Intermediation and Delegated Monitoring. *The Review of Economic Studies*, 51:393-414, 1984.

D. M. Roodman. A Note on the Theme of too Many Instruments. *Oxford Bulletin of Economics and Statistics*, 71:135-158, 2009.

David Roodman. How to do Xtabond2: An Introduction to Difference and System GMM in Stata. Working Papers 103, Center for Global Development, 2006.

E. Chang, S. Guerra, E.J.A. Lima, and B.M. Tabak. The Stability-Concentration Relationship in the Brazilian Banking System. *Journal of International Financial Markets, Institutions and Money*, 18: 388-397, 2006.

E. Hayden, D. Porath, and N. v. Westernhagen. Does Diversification Improve the Performance of German Banks? Evidence from Individual Bank Loan Portfolios. *Journal of Financial Services Research*, 32: 123-140, 2007.

F. Windmeijer. A Finite Sample Correction for the Variance of Linear Two-Step GMM Estimators. *Journal of Econometrics*, 126(1):25-51, 2005.

G. S. F. Bruno. Approximating the bias of the LSDV estimator for dynamic unbalanced panel data models. *Economic Letters*, 87:361-366, 2005.

J. Morris. Risk Diversification in the Credit Portfolio: An Overview of Country Practices. IMF Working Paper WP/01/200, International Monetary Fund, 2001

L. Norden and M. Szerencses. Migration and Concentration Risks in Bank Lending: New Evidence from Credit Portfolio Data. Working paper, University of Mannheim, 2005.

M. Arellano and S. Bond. Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations. *Review of Economic Studies*, 58:277-297, 1991.

M. Jensen. Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers. *American Economic Review*, 76:323-329, 1986.

R. Bebczuk and A. Galindo. Financial Crisis and Sectoral Diversification of Argentine Banks, 1999-2004. *Applied Financial Economics*, 18:199-211, 2008.

R. Blundell and S. R. Bond. Initial Conditions and Moment Restrictions in Dynamic Panel Data Models. *Journal of Econometrics*, 87:115-143, 1998

R. McElligott and Rebecca Stuart. Measuring the Sectoral Distribution of Lending to Irish Non-Financial Corporates. Financial stability report, Central Bank and Financial Services Authority of Ireland, 2007.

S. Bond. Dynamic Panel Data Models: A Guide to Microdata Methods and Practice. *Portuguese Economic Journal*, 1:141-162, 2002.

S. Rossi, M. Schwaiger, and G. Winkler. How Loan Portfolio Diversification Affects Risk, Efficiency and Capitalization: A Managerial Behavior Model for Austrian Aanks. *Jornal of Banking and Finance*, 32:2218-2226, 2009.

V. Acharya, I. Hasan, and A. Saunders. Should Banks Be Diversified? Evidence from Individual Bank Loan Portfolios. *Journal of Business*, 32:1355-1412, 2006.

Mutual Trust Bank Ltd., Annual Report, 2014-2018

Eastern Bank Ltd., Annual Report, 2014-2018

Prime Bank Ltd., Annual Report, 2014-2018

Bank Asia Ltd., Annual Report, 2014-2018

NCC Bank Ltd., Annual Report, 2014-2018

The Asian Institute of Research
Economics and Business Quarterly Reviews
Vol.7, No.1, 2024: 85-101
ISSN 2775-9237

DOI: 10.31014/aior.1992.07.01.561

Effect of Liquidity Management on Profitability: A Comparative Analysis between Public Sector and DSE Listed Private Sector Banks in Bangladesh

Mithun Chokroborty[1], Al Hasan[2]

[1] Faculty Grade-5, Bangladesh Academy for Securities Markets
[2] Faculty Grade-5, Bangladesh Academy for Securities Markets

Abstract:
This study is all about the effect of liquidity management on profitability of public and DSE listed private sector banks and compares the outcomes regarding liquidity management. In this study, is taken 18 banks of Bangladesh in total as sample (9 banks from public sector where 6 banks are state owned and 3 banks are specialized and 9 banks from private sector which are listed in DSE) and also taken five years data from 2013 to 2017 for assessing the impact of liquidity management on profitability. As there is always a trade-off between liquidity and profitability, in this study find out either this trade-off is exiting in the each of banking sector or not and also assess the efficiency of liquidity management of the banks. The liquidity condition of the banking industry of Bangladesh is also highlighted in this study where it is seen that banking industry is facing some problem regarding liquidity from the 2018. The analysis part of the study is assessed the condition of the liquidity management before 2018 and found out the relationship between liquidity and profitability of public sector and private sector banks. To assess the relationship is used some financial ratios like: liquidity management is measured by current ratio, cash-deposit ratio, credit-deposit ratio and investment-deposit ratio and profitability is measured by return on assets and return on equity. By using the descriptive statistics, find out the average, standard deviation, maximum and minimum value of each ratios. The Pearson Correlation is been used to assessed the correlation between each variable with others. The relationship between liquidity and profitability is evaluated through regression model where first consider the return on assets as dependent variable and all liquidity ratios as independent variables. Again here is assessed the relationship by taking return on equity as dependent variable. After developing the model based on regression for public sector and the DSE listed private sector banks individually, the outcomes are compared to find out the effect of liquidity management on profitability and find out the efficiency in liquidity management. It is found that the DSE listed private sector banks are more efficient in liquidity management than public sector banks in Bangladesh. Because the DSE listed private sector banks are managed their liquidity function so well that it is not affecting the profitability of DSE listed private sector banks. On the other hand, the public sector banks need to improve their performance regarding liquidity management so that they can manage liquidity and profitability at the same time and remain competitive with DSE listed private sector banks in Bangladesh.

Keywords: Liquidity Management, Profitability, Public Sector Banks, Dhaka Stock Exchange (DSE) listed Private Sector Banks, Return on Assets and Return on Equity

1. Background of the study:

The study is all about the effect of liquidity management on profitability of public sector and DSE listed private sector banks in Bangladesh and comparative analysis between them. Banks are always faced tradeoff between profitability and liquidity. If a bank keeps more amount of money for liquid purpose, it will earn lower amount of profit and vice versa. So, banks have to maintain balance between profitability and liquidity. This study is based on the effect of liquidity management on public and DSE listed private sector banks of our county and find out the efficiency of public sector and DSE listed private sector liquidity management based on comparative analysis.

2. Objectives of the study:

The objectives of the study are:

i. To find out the return on equity (ROE) and return on assets (ROA) as indicators of profitability and calculate some ratios as indicators of liquidity management
ii. To identify the relation between liquidity and profitability of public sector banks
iii. To identify the relation between liquidity and profitability of DSE listed private sector banks
iv. To conduct a comparative analysis between public sector and DSE listed private sector banks for detecting the effect of liquidity management on profitability.

3. Methodology:

3.1. Nature of the study

The study is descriptive in nature and used quantitative data. The study covers five years data of public sector and DSE listed private sector banks. This helps to find out the effect of liquidity management on profitability in descent manner.

3.2. Sources of the data

The study is based on the secondary data only. To collect the data use the website of selected public and DSE listed private sector banks for annual report of five years. The website of news portal and some articles is also been used for collecting the data.

3.3. Population size

The numbers of scheduled banks in Bangladesh has 61 according to the Bangladesh Bank. The public sector consists of six sate owned banks and three specialized banks. The private sector has 33 conventional banks, 10 Islamic banks and 9 foreign banks. To find out the effect of liquidity management on profitability of public sector and DSE listed private sector banks, it is the total population size for the study.

3.4. Sample size

Here is taken nine banks from the public sector banks out of nine (including three specialized banks) and taken nine DSE listed private sector banks out of thirty three conventional banks. So, in total 18 banks are selected out of 61 banks for this study. On the other hand, five years financial data of these banks is taken for the study from the financial year 2013 to 2017.

3.5. Data analysis tools

The study is used following tool for data analysis purpose; they are:

i. Using the descriptive statistics for finding liquidity management and profitability of public sector and DSE listed private sector banks through financial ratios by using mean and standard deviation.
ii. To use ratio as indicators of liquidity and profitability. For measuring liquidity is used current ratio (CR), cash-deposit ratio (CDR), credit-deposit ratio (CRDR) and investment-deposit ratio (IDR). The current ratio (CR) is calculated by using formula of current assets divided by current liabilities and the others like cash-deposit ratio (CDR), credit-deposit ratio (CRDR) and investment-deposit ratio (IDR) are calculated by using formula of cash held by bank divide by aggregate deposit, outstanding credit divided by aggregate deposit and outstanding investment divided by aggregate deposit respectively. On the other hand, to assess the profitability is used the ratios, such as return on assets (ROA), return on equity (ROE). The return on assets (ROA) is calculated by using formula of net income divided by total assets and the return on equity (ROE) is calculated by sing formula of net income divided by total equity.
iii. To find out the correlation between liquidity ratios and profitability ratio is used Pearson Correlation in this study.
iv. To use multiple regression model to find out the relationship between liquidity management and profitability of public and DSE listed private sector banks. The regression model is used in the study is given below:
$Y1\ (ROA) = \alpha + \beta 1\ CR + \beta 2\ CDR + \beta 3\ CRDR + \beta 4\ IDR + \epsilon$
$Y2\ (ROE) = \alpha + \beta 1\ CR + \beta 2\ CDR + \beta 3\ CRDR + \beta 4\ IDR + \epsilon$
Where Y1 for ROA and Y2 for ROE are as dependent variables for each independent regression model and CR, CDR, CRDR and IDR are considered as independent variables for all regression models in this study. The null hypothesis (H0) for this study is there is no significant relationship between profitability of commercial banks. To test the significant of these regression model is used F-test. To carry out the F-test, Analysis of Variance (ANOVA) is conducted in this study.

These tools are used in the study for data analysis purpose and find out the effect of liquidity management on profitability of public sector and DSE listed private sector banks and conduct comparative analysis between public sector and DSE listed private sector banks based on the result of the analysis.

4. Literature Review:

A study conducted by Ali Sulieman Alshantti (2014) states that liquidity indicators (such as quick ratio, investment ratio, liquid assets ratio etc.) affect over banks' profitability that are measured by return on asset (ROA) and return on equity (ROE). The researchers recommend that there is a need for optimum utilization of liquidity in order to enhance banks' profitability. This study found that increase in quick ratio and investment ratio caused to increase in Jordanian commercial banks' profitability. On the other hand, increase in liquid assets ratio and capital ratio leads to decrease Jordanian commercial banks' profitability. So, the banks should adopt well developed framework for liquidity management to ensure adequate profit for banks and need to manage liquidity of banks in more efficient manner.

The study of Muhammad Shaukat, Mustabsar Awais and Aisha Khursheed (2016) was conducted to inspect the tradeoff between liquidity and profitability in private sector banks of Pakistan. The study revealed that there is significant relationship between bank liquidity and return on assets. So, it recommends that banks should assess and restructure their strategies for managing liquidity.

Oluwatobi Fagboyo, Anjola Adeniran and Abayomi Adedeji (2018) were published a paper to find out the impact of liquidity management on profitability within the Nigerian deposit money banks. This study found that some liquidity ratio impact positive on profitability and others have negative impact over profitability. So, the paper recommend that banks should adopt economic, effective, efficient management of liquidity with a general framework for achieving optimum result for profitability of the banks.

The study of Mathur (2002) found that private banks of India perform better than public banks of India because private sector banking has a legal support that makes them free from adversaries of extraneous pressures as well

as least involved in the socioeconomic policies of the government. The study was based on the influencing factors that cause changes the profitability of the bank including the liquidity management.

A study was conducted by Birajit Mohanty and Shweta Methrotra (2018) that is about the impact of liquidity management on profitability of public sector and private sector banks of India. The study used return on equity and return on assets as indicators of profitability and use cash deposit ratio, investment deposit ratio and credit deposit ratio for indictors for liquidity management. The study concluded that the commercial bank can focus on increasing their profitability without affecting their liquidity and vice versa.

Bordeleau and Graham (2010), using a sample of large US and Canadian banks, found that profitability generally improved for banks that held some liquid assets. However, there is a point at which holding further liquid assets reduced banks' profitability. Affiliate locations that are important for the parent bank revenue streams are relatively protected from liquidity reallocations in the organization.

Nicola Cetorelli and Linda S. Goldberge (2012) was conducted a study related to liquidity management of U.S. global banks. This paper revealed that parent banks, when hit by a funding shock, reallocate liquidity in the organization according to a locational pecking order.

Victor Curtis Lartey, Samuel Antwi and Eric Kofi Boadi (2013), using seven listed banks of Ghana out of nine banks and data for the period 2005-2010 of Ghana banks, concluded in their paper that a very weak positive relationship between the liquidity and the profitability of the listed banks in Ghana and both the liquidity and profitability of the listed banks were declining.

Sunny Obilor Ibe (2013) found that liquidity management is indeed a crucial problem on the Nigerian banking industry. The study recommend that banks should engage competent and qualified personnel in order to take right decision especially with the optimal level of liquidity and maximize profit.

Nimer et al. (2013), by using the financial reports of 15 Jordanian banks for the period of from 2005-2011, concluded that liquidity has a significant negative influence on the profitability because of banks having excessive liquidity instead of investing money to generate profit.

All the studies are about the impact of liquidity management on profitability of banks from different countries. But there is no study conducted about a comparative analysis between public sector and DSE listed private sector banks in Bangladesh based on the effects of liquidity management on profitability. So, the study is all about the effect of liquidity management on profitability of public sector and DSE listed private sector banks in Bangladesh and comparative analysis between public and DSE listed private sector banks in Bangladesh.

5. Theoretical Framework of the study:

5.1. Liquidity management

Liquidity means how quickly and easily assets or securities can be converted into cash without impacting its price or intrinsic value. Liquidity management is a concept that describe a company's ability to meet financial obligations through cash flow, funding activities and capital management. Liquidity can be managed by asset liquidity management (or asset conversion strategies, borrowed liquidity management strategies and balanced liquidity management strategies.

The asset liquidity management is a strategy of depending on liquid assets that can be readily sold for cash to meet a bank's liquidity needs. On the other hand, when a bank reliance upon borrowed funds to meet a bank's liquidity need then it is called borrowed liquidity management strategy. The combined use of liquid asset holdings (asset management) and borrowed liquidity (liability management) to meet a bank's liquidity need that is called balanced liquidity management strategy.

The liquidity position or management of liquidity of banks can be assessed by calculating liquidity ratio such as current ratio, quick ratio other ratio like cash deposit ratio, investment deposit ratio and credit deposit ratio etc. The management of liquidity is crucial for the bank as well as maintain desire amount of profit. So how well or efficient a bank preform its liquidity management function that can be measured by these ratios.

5.2. Profitability

The extent to which a business yields profit or financial gain is called profitability. It is the ability of a company to use its resources to generate revenues in excess of its expenses. The profitability ratios are a class of financial metrics that are used to assess a business's ability to generate earnings relative to its revenue, operating costs, assets and shareholders' equity over time, using data from a specific point in time.

The profitability ratios are two types. First one is margin ratios such as gross profit, operating profit, net profit and earnings before interest, taxes, depreciation and amortization. The other is return ratios such as return on assets, return on invested capital and return on equity. How well a bank performs its function and earn optimal amount of profit that can be measured by profitability ratios.

5.3. Tradeoff between liquidity and profitability

The bank has to maintain certain about of liquidity and profit at the same time. So, banks face tradeoff between liquidity and profitability because there is negative relationship between those. When a bank keep more amount of cash in hand for the liquidity purpose, then it will be left with small amount of funds for investment that generates profit for the bank. On the other hand, whenever a bank invest more money that collect as deposit from public, then it keep less amount of funds in hand as cash. In that situation, bank can face a situation where it run out of cash and unable meet to its obligation towards customers. So, liquidity management is a crucial issue to maintain a certain amount of cash in hand to meet client's obligation and at the same time invest its funds in profitable sector to generate optimal amount of profit. The banks have to generate a certain amount of profit so that it can pay dividend its shareholders in regular interval.

So, banks are always face tradeoff between liquidity and profitability. The management of banks needs to take efficient and effective policies with a general framework for the liquidity management and maintain profitability at the same time.

6. Framework of the study:

This study is all about inspecting the impact of liquidity management on profitability of public sector and DSE listed private sector banks in Bangladesh and comparative analysis between them. For that following theoretical framework is applied:

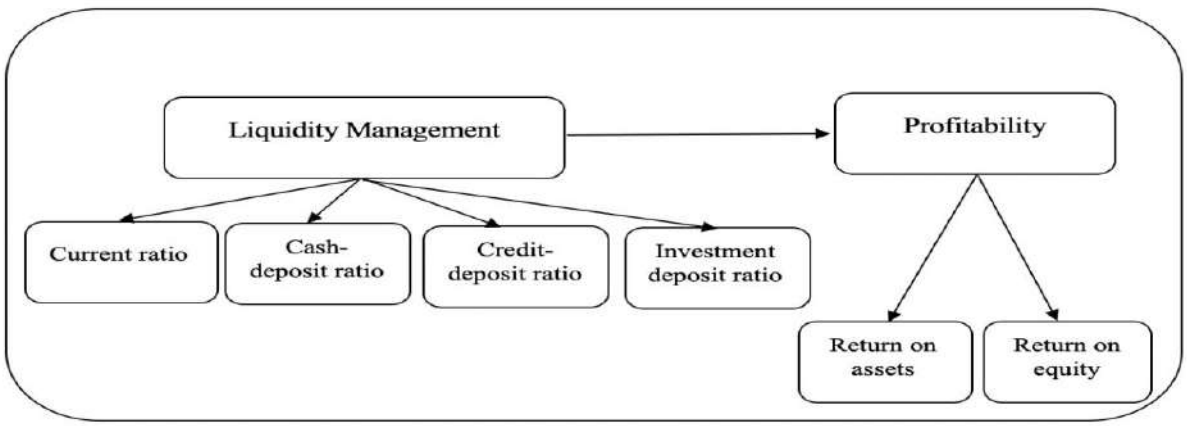


Figure 1: Theoretical Framework

So, this is the framework that is used in the study to find out the impact of liquidity management on profitability of public sector and DSE listed private sector banks in Bangladesh. To assess the liquidity management is used the ratios like current ratio, cash to deposit ratio, credit to deposit ratio and investment to deposit ratio. To assess the profitability is used return on assets and return on equity ratio. The impact of the liquidity management on profitability of the banks can be measured and analyzed by these ratios. By comparing the outcome of individual sector, it can be found out that which is more efficient than other in liquidity management and keep certain amount of profitability.

6.1. Current Liquidity Scenario of Banking Industry

At present, the liquidity position of banking industry is not satisfactory at all. Because liquidity crunch in the banking industry is continuing and the growth of deposit is lethargic at the same time. In spite of offering 11-12% interest rate to deposit in the 2019, the growth of the deposit is not up to mark. On the other hand, the recovery of loans is in question especially for the state-owned banks. The deposit growth was 10 percent in 2017 but the situation become worse day by day as around 8-9 percent growth of deposit. As the growth of the deposit is not improved, it impact on banks' liquidity. The excess liquidity condition of banking industry is presented in below:

Table 1: Excess liquidity in banking industry

Year	Amount (Crore in TK)
December, 2017	86,696
March, 2018	72,750
June, 2018	79,650
September, 2018	81,088
December, 2018	76,393
February, 2019	63,921

Source: https://www.thedailystar.net/business/news/liquidity-crunch-intensifying-1742770

According to the Bangladesh bank the excess liquidity in banking industry as the surplus amount stood at TK. 63,921 crore as of February 2019 which is down by 5.82 percent from a month earlier and 14.56 percent year on year. The data in the above table is presented below in chart:

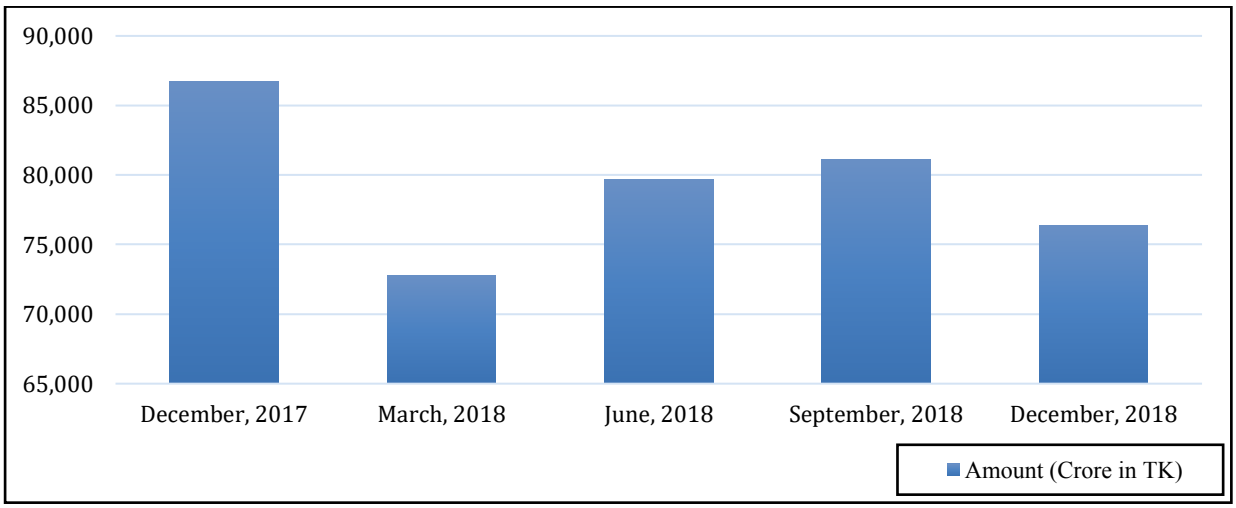


Figure 2: Excess Liquidity in Banking Industry

The above graph showed that the excess liquidity in banking sector is not consistent and the sharp declined of excess liquidity of banking sector as of February, 2019. So, it is cleared that the liquidity position of banking industry is not satisfactory as it is represented by the height of each bar of the chart.

The deposit growth of the banking industry is declining from the December, 2017 which is not changed. The deposit growth of banking industry is given below in table:

Table 2: Deposit growth of banking industry

Year	Deposit Growth (in percentage)
December, 2017	10.22%
March, 2018	8.84
June, 2018	10.29
September, 2018	9.15
December, 2018	9.04
February, 2019	9.90

Source: https://www.thedailystar.net/business/news/liquidity-crunch-intensifying-1742770

The deposit growth of the banking industry is declining tend after June, 2018 but in February, 2019 is changed as increased compared to December, 2018. As increased in interest rate is offer by banking industry, the deposit growth rate is increased in this year. The deposit growth of banking industry is presented below in chart:

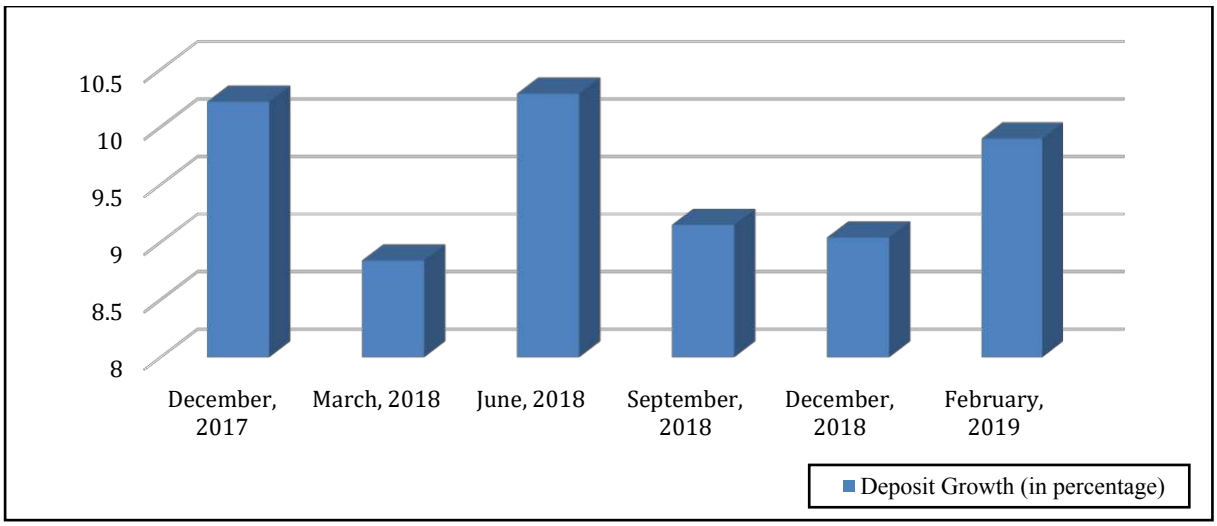


Figure 3: Deposit Growth of Banking Industry

The deposit growth of banking industry is not consistent as there is up and down trend in the growth as shown in the above chart. The liquidity crunch is happened in recent time due to the lethargic deposit growth of the banking industry.

The upward trend of default loan is one of the reasons of the liquidity crunch as the banking sector stood at 93,370 crore which is 10.30 percent of total outstanding loan. Due to default loan is climb up in the banking industry, general people is not feeling comfort to save their funds in the banks. They are switching their funds from banks to other safe profitable sources like national savings certificate. So, the liquidity position of banking sector is not in satisfactory level from the last year and its continuing.

In 2018, banking sector was experienced a liquidity crisis. To meet customers' withdrawals demand, Bangladesh Bank was compelled to lend TK.3500 crore to the banks. The amount of fund borrowed by different banks to meet liquidity crisis through inter-bank borrowing is given below in table:

Table 3: Inter-bank Borrowing

Banks' Name	Amount (Crore in TK)
AB Bank Limited	400
Eastern Bank Limited	183
Trust Bank Limited	50
National Bank Limited	97.5
NRB Bank Limited	41
Uttara Bank Limited	27
Standard Bank Limited	25

Source: https://archive.bangladesh-post.net/banks-facing-liquidity-crisis/

So, the banking industry is facing liquidity crisis from 2018 and it is continuing as shown in the above table. The AB bank limited is in the top of table in terms of inter-bank borrowing to meet up their obligation towards customers.

To mitigate the problem regarding liquidity, there are taken a lot of steps by government and Bangladesh Bank. Like; adjusting the limit of advance to deposit ratio, to increase tax over the interest earn from national savings certificate and so on.

6.2 Analysis:

The numbers of scheduled banks in Bangladesh are 61 including 6 state-owned banks, 3 specialized banks, 33 conventional private commercial banks, 10 islamic banks and 9 foreign banks. To conduct comparative analysis between public sector and DSE listed private sector banks based on the effect of liquidity management on profitability, are taken 9 banks from public sector bank (including 6 state-owned banks and 3 specialized banks) and 9 banks from conventional private commercial banks as sample in this study. The nine public sector banks which are taken in this study, they are: Sonali Bank Limited, Janata Bank Limited, Agrani Bank Limited, Rupali Bank Limited, BASIC Bank Limited, Bangladesh Development Bank Limited (BDBL), Bangladesh Krishi Bank (BKB), Rajshahi Krishi Unnayan Bank (RAKUB) and Probashi Kallyan Bank (PKB). The nine banks of DSE listed private sector banks which is taken as sample in this study, they are: AB Bank Limited, Eastern Bank Limited, Trust Bank Limited, Dhaka Bank Limited, Prime Bank Limited, City Bank Limited, Brac Bank Limited, Pubali Bank Limited and Standard Bank Limited. To analysis between public sector and DSE listed private sector banks takes data from the period 2013 to 2017. In this study, to identify the relationship between liquidity management and profitability is used some ratios: for assessing banks' efficiency in liquidity management is used current ratio, cash-deposit ratio, credit-deposit ratio and investment-deposit ratio and for assessing profitability of the banks is used return on assets (ROA) and return on equity (ROE) ratios. The comparative analysis between public sector and DSE listed private sector banks based on the effects of liquidity management on profitability (by using some financial ratios) is described below in terms of mean, standard deviation, correlation and regression:

6.3. Descriptive statistics

The effect of liquidity management on profitability of public sector and DSE listed private sector banks is assessed by using descriptive statistics tools such as mean, standard deviation, maximum and minimum values of the variables. The descriptive statistics of liquidity management and profitability of public sector and DSE listed private sector banks, through using financial ratios (current ratio, cash-deposit ratio, credit-deposit ratio, investment-deposit ratio, return on assets and return on equity) during the period from 2013 to 2017, is calculated in terms of mean and standard deviation. To compare liquidity management and profitability of public sector and DSE listed private sector banks, the descriptive statistics is given below in table:

Table 4: Descriptive statistics of measures of liquidity management and profitability Public Sector Banks

Variables	Minimum	Maximum	Mean	Standard Deviation (%)
Current Ratio (CR)	0.7355	4.0681	1.4398	1.0206
Cash-Deposit Ratio (CDR)	0.4619	9.6047	7.1499	2.6419
Credit-Deposit Ratio (CRDR)	42.0984	292.2851	99.7656	76.3696
Investment-Deposit Ratio(IDR)	0.0000	43.3784	24.2977	18.7909
Return on Assets (ROA)	-4.5386	1.6350	-0.4437	2.0318
Return on Equity (ROE)	-36.4391	20.6735	-0.7681	17.5584

Table 5: Descriptive statistics of measures of liquidity management and profitability DSE listed Private Sector Banks

Variables	Minimum	Maximum	Mean	Standard Deviation (%)
Current Ratio (CR)	0.9402	1.2166	1.0692	0.9758
Cash-Deposit Ratio (CDR)	7.1558	11.3293	9.2191	1.4609
Credit-Deposit Ratio (CRDR)	77.1266	92.21111	84.6103	5.1257
Investment-Deposit Ratio(IDR)	14.3918	26.4405	18.9023	3.9804
Return on Assets (ROA)	0.3734	1.2984	0.9174	0.3109
Return on Equity (ROE)	4.7681	15.4962	10.8890	3.2890

According to tables the analysis through descriptive statistics showed that the measure of profitability such as ROA and ROE of public sector banks are -0.4437 and -0.7681 respectively (on average) whereas ROA and ROE of DSE listed private sector banks are 0.9174 and 10.8890 respectively (on average). So, the DSE listed private sector banks are more effectively and efficiently performed than public sector banks in terms of profitability. The mean values of liquidity measures such as CR, CDR, CRDR and IDR of public sector are 1.4398, 7.1499, 99.7656 and 24.2977 respectively. On the other hand, the mean value of CR, CDR, CRDR and IDR of DSE listed private sector are 1.0692, 9.2191, 84.6103 and 18.9023 respectively. The CR and CDR of DSE listed private sector is higher than public sector and the CRDR and IDR ratio of public sector is higher than DSE listed private sector. In spite of higher CRDR and IRD, the public sector banks' profitability is lower than DSE listed private sector banks'. This means, the liquidity management of DSE listed private sector banks is more efficient than public sector banks in Bangladesh based on the measures of descriptive statistics.

6.4. Correlation

The correlation between measures of liquidity management such as current ratio (CR), cash-deposit ratio (CDR), credit-deposit ratio (CRDR) and investment-deposit ratio (IDR) and measures of profitability such as return on assets (ROA) and return on equity (ROE) is analyzed by using Pearson Correlation. The correlation between different measures of liquidity management profitability of public sector and DSE listed private sector banks is given below:

Table 6: Correlation between different measures of liquidity and profitability of public sector banks

Variables		CR	CDR	CRDR	IDR	ROA	ROE
CR	Pearson Correlation	1	-.927**	.943**	-.533	.335	.177
	Sig. (2-tailed)		.000	.000	.140	.378	.648

CDR	Pearson Correlation	-.927**	1	-.875**	.301	-.511	-.031
	Sig. (2-tailed)	.000		.002	.432	.160	.937
CRDR	Pearson Correlation	.943**	-.875**	1	-.696*	.188	-.092
	Sig. (2-tailed)	.000	.002		.037	.628	.815
IDR	Pearson Correlation	-.533	.301	-.696*	1	.527	.130
	Sig. (2-tailed)	.140	.432	.037		.145	.739
ROA	Pearson Correlation	.335	-.511	.188	.527	1	.177
	Sig. (2-tailed)	.378	.160	.628	.145		.648
ROE	Pearson Correlation	.177	-.031	-.092	.130	.177	1
	Sig. (2-tailed)	.648	.937	.815	.739	.648	
**. Correlation is significant at the 0.01 level (2-tailed).							
*. Correlation is significant at the 0.05 level (2-tailed).							

Table 7: Correlation between different measures of liquidity and profitability of DSE listed private sector banks

Variables		**CR**	**CDR**	**CRDR**	**IDR**	**ROA**	**ROE**
CR	Pearson Correlation	1	-.142	-.654	.548	.318	-.237
	Sig. (2-tailed)		.715	.056	.127	.405	.539
CDR	Pearson Correlation	-.142	1	-.238	-.268	.662	.635
	Sig. (2-tailed)	.715		.537	.486	.052	.066
CRDR	Pearson Correlation	-.654	-.238	1	-.518	-.338	-.088
	Sig. (2-tailed)	.056	.537		.153	.374	.823
IDR	Pearson Correlation	.548	-.268	-.518	1	-.295	-.546
	Sig. (2-tailed)	.127	.486	.153		.441	.128
ROA	Pearson Correlation	.318	.662	-.338	-.295	1	.782*
	Sig. (2-tailed)	.405	.052	.374	.441		.013
ROE	Pearson Correlation	-.237	.635	-.088	-.546	.782*	1
	Sig. (2-tailed)	.539	.066	.823	.128	.013	
*. Correlation is significant at the 0.05 level (2-tailed).							

The correction between ROA as profitability measure and CR (0.335), CRDR (0.188) and IDR (0.527) of public sector banks are positive and not statistically significant. On the other hand, the correlation between ROA and CDR (-0.511) of public sector banks is negative which is statistically insignificant. There are positive correlation between profitability measures as ROE and liquidity measures as CR (0.177) and IDR (0.130) but not statistically significant. Whereas there are negative correlation between profitability measures as ROE and liquidity measures by the ratios as CDR (-0.031) and CRDR (-0.092) but not statistically significant.

The correlation between profitability variables as measured by ROA and Liquidity variables as measured by CR (0.318) is positive for the DSE listed private sector banks which are not statistically significant. On the other hand, there are negative correlation between ROA and liquidity variables as measured by CRDR (-0.338) and IDR (-0.295) that is not statistically significant. In private sector banks, there is positive correlation between ROE and CDR (0.635) which are statistically insignificant. The correlation between ROE of DSE listed private sector banks and Liquidity variables as measured by CR (-0.237), CRDR (-0.088) and IDR (-0.0546) are found to be negative which are not statistically significant. It is found that correlation between profitability variables and liquidity variables, all are statistically insignificant for both public sector and DSE listed private sector banks.

6.5. The effect of liquidity management on profitability of public sector and DSE listed private sector banks and comparative analysis between public sector and DSE listed private sector banks:

To assess the effect of liquidity management on profitability of public sector and DSE listed private sector banks, is used the data for the period from 2013 to 2017 on average of nine public sector and DSE listed private sector banks each (in total 18 banks) and developed regression model. In this model return on assets and return equity as measure of profitability are considered as dependent variables in each regression model. On the other hand, current ratio (CR), cash-deposit ratio (CDR), credit-deposit ratio (CRDR) and Investment-deposit ratio (IDR) as measures of liquidity are considered as independent variables. The summary of regression model is presented in below:

Table 8: Model summary and ANOVA (F) test result of public sector banks (Dependent Variable: ROA)

Variables	Coefficient (B)	Standard Error	t value	Significant
(Constant)	-0.189	0.067	-2.811	0.048
CR	0.008	0.010	0.828	0.454
CDR	0.920	0.500	1.842	0.139
CRDR	0.057	0.021	2.705	0.054
IDR	0.204	0.043	4.783	0.009

R=0.966, R^2=0.933, Adjusted R^2=0.865, F-value=13.869 at p-value=0.013

Table 9: Model summary and ANOVA (F) test result of DSE listed private sector banks (Dependent Variable: ROA)

Variables	Coefficient (B)	Standard Error	t value	Significant
(Constant)	-0.018	0.033	-0.553	0.610
CR	0.022	0.011	1.955	0.122
CDR	0.132	0.061	2.149	0.098
CRDR	-0.001	0.023	-0.023	0.982
IDR	-0.039	0.025	-1.590	0.187

R=0.882, R^2=0.777, Adjusted R^2=0.555, F-value=3.492 at p-value=0.127

Based on the above outcomes, the regression model for the public sector bank becomes:

Y1 (ROA) = - 0.189 + 0.008 CR + 0.920 CDR + 0.057 CRDR + 0.204 IDR

Based on the above outcomes, the regression model for the DSE listed private sector bank becomes:

Y2 (ROA) = - 0.018 + 0.022 CR + 0.132 CDR - 0.001 CRDR – 0.039 IDR

According to the above results, it is found that the relationship between dependent variable (ROA as profitability measure) and independent variables (CR, CDR, CRDR and IDR as liquidity measures) are positive for the public sector banks. On the other hand, the positive relationship between ROA and explanatory variables: CR and CDR

are found and the negative relationship between ROA and explanatory variables: CRDR and IDR are found for the DSE listed private sector banks. Based on t value for the public sector banks, the calculated t values for the CR and CDR are less than table value at 5% significant level which indicates these two explanatory variables have no significant impact on dependent variables. On the other hand, the calculated t value for the CRDR and IDR are more than tabular value. So it indicates, these two variables have significant impact on dependent variable ROA. The t value for the DSE listed private sector banks, the calculated t values are less than tabular value for all explanatory variables. This means, all explanatory variables have no significant impact over the dependent variable ROA.

The two-tailed p value reveal that the explanatory variables have no significant impact over dependent variable of public sector banks as the values are greater than 0.05 expect for the IDR.

This means IDR has significant impact on the dependent variable ROA of public sector banks as the p value is less than 0.05. On the other hand, the p values of explanatory variables of DSE listed private sector banks are greater than 0.05 which indicates explanatory variables have not significant impact on dependent variables.

The F value of public sector is more than tabular value for the public sector banks which means the explanatory variables have significant relationship with dependent variable. This can be concluded that there is significant relationship between liquidity and profitability of public sector banks and rejected the null hypothesis. The p value (0.013) is less than 0.05 which is also indicated there is significant relationship between liquidity and profitability of public sector banks as ROA considered as dependent variable.

The F value of DSE listed private sector banks is less than tabular values and p value is also more than 0.05. This means that there is no significant relationship between liquidity and profitability of DSE listed private sector banks. So, the explanatory variables have no significant impact over the dependent variable ROA of the DSE listed private sector banks.

The R^2 of the both public sector and DSE listed private sector banks reveal that the explanatory variables can explain the dependent variable 93.3% and 77.7% respectively. The adjusted R^2 values of public sector and DSE listed private sector banks are 86.5% and 55.5% respectively which are statistically significant. According to the adjusted R^2, there is significant relationship between liquidity and profitability for public sector and DSE listed private sector banks.

The overall result is that there is significant relationship between liquidity and profitability (as measured by ROA) for the public sector banks according to the t-values, p-values and F value result. So, the null hypothesis can reject for the public sector banks. There are positive relationship between explanatory variables and dependent variables ROA. On the other hand, for DSE listed private sector banks it is found that there is no significant relationship between liquidity and profitability according to the t values, p-values and F-value expect the adjusted R^2. So, the null hypothesis cannot be rejected. The relationship between liquidity and profitability (as measures by ROA) of DSE listed private sector banks is not significant or it can be said there is no relationship between them according to the above result. So there is a possibility that DSE listed private sector banks are efficient in liquidity management that help them to keep liquidity and maintain profitability at the same time.

But it is difficult to say the liquidity management of DSE listed private sector banks is more efficient than public sector banks. Because there is negative relationship found in CRDR and IDR as liquidity measures and ROA profitability measures. On the other hand, public sector banks profitability is positively related with liquidity (measured by ROA) which is a good indication.

To verify further, the impact on liquidity management on profitability of public sector and DSE listed private sector banks is taken ROE as measure of profitability instead of ROA as dependent variable in the regression model. The summary of regression model is presented in below:

Table 10: Model summary and ANOVA (F) test result of public sector banks (Dependent Variable: ROE)

Variables	Coefficient (B)	Standard Error	t value	Significant
(Constant)	-0.171	1.048	-0.163	0.878
CR	0.548	0.158	3.481	0.025
CDR	2.412	7.779	0.310	0.772
CRDR	-0.706	0.330	-2.138	0.099
IDR	-0.389	0.666	-0.585	0.590

R=0.884, R^2=0.782, Adjusted R^2=0.563, F-value=3.579 at p-value=0.122

Table 11: Model summary and ANOVA (F) test result of DSE listed private sector banks (Dependent Variable: ROE)

Variables	Coefficient (B)	Standard Error	t value	Significant
(Constant)	0.358	0.458	0.781	0.478
CR	-0.036	0.154	-0.235	0.826
CDR	0.851	0.859	0.991	0.378
CRDR	-0.235	0.322	-0.730	0.506
IDR	-0.476	0.346	-1.378	0.240

R=0.783 ,R^2=0.612, Adjusted R^2=0.225, F-value=1.579 at p-value=0.334

Based on the above outcomes, the regression model for the public sector bank becomes:

Y1 (ROE) = - 0.171 + 0.548 CR + 2.412 CDR - 0.706 CRDR - 0.389 IDR

Based on the above outcomes, the regression model for the DSE listed private sector bank becomes:

Y2 (ROE) = 0.358 - 0.036 CR + 0.851 CDR - 0.235 CRDR – 0.476 IDR

According to the above results, it is indicated that there are positive relationship between ROE as profitability measure and CR and CDR as liquidity measures and be negative relationship between ROE and liquidity variables measure as CRDR and IDR for the public sector banks. On the other hand, there is positive relation between CDR and ROE and negative relationship between liquidity variables as measured by CR, CRDR and IDR and profitability as measured by ROE for the DSE listed private sector banks according to the above model. But according to the t values of each explanatory variables are less than tabular values at 5% significant level for the public sector banks which indicate explanatory variables have no significant impact over dependent variables ROE expect the CR. The CR has significant impact over ROE for the public sector banks. For the DSE listed private sector banks, it is found that t values of each explanatory variables are less than tabular value at 5% significant level. This means that the explanatory variables have no significant over dependent variable ROE.

The two-tailed p-values of explanatory variables are greater than 0.05 for both of the public sector and DSE listed private sector banks that means the explanatory variables have no significant impact over dependent variable ROE.

The F-value of the regression model for the public sector banks is less than the tabular value which indicates there is no significant impact or relationship between independent variables and dependent variable. The p-value of the model is greater than 0.05 which indicates the same outcome for public sector banks. On the other hand, the F-value of DSE listed private sector banks is less than tabular values that means there is no significant relationship between liquidity and profitability (measured by ROE) and the p-value is also greater than 0.05 which means the independent variables (liquidity as measured by CR, CDR, CRDR and IDR) have no significant impact over dependent variable (profitability as measured by ROE). So, there are no significant relationship between liquidity and profitability for both public sector and DSE listed private sector banks according to the F- value of the each model.

The $R^2$of the both public sector and DSE listed private sector banks reveal that the explanatory variables can explain the dependent variable 78.2% and 61.2% respectively. The adjusted R^2 values of public sector and DSE

listed private sector banks are 56.3% and 22.5% respectively which are statistically significant. According to the adjustedR^2, there is significant relationship between liquidity and profitability for public sector and DSE listed private sector banks. There is a gap between $R^2$and adjusted R^2 because there are many independent variables that impact on profitability of banking industry other than included variables for this study.

The overall result indicates that there is no significant relationship between liquidity and profitability of public sector banks according to the t-values, p-values and F value. So, the null hypothesis cannot be rejected. On the other hand, there is no significant relationship between liquidity and profitability of DSE listed private sector banks according to the t-values, p-values and F value and the null hypothesis cannot be rejected. So, it indicates that the liquidity management of public sector and DSE listed private sector banks is good enough to immunize the negative relationship between liquidity and profitability. The public sector and DSE listed private sector banks are able to maintain liquidity position in desire level and earn profit at the same time.

It is found that there is significant relationship between liquidity and profitability for the public sector banks in case of measuring profitability by ROA. On the other hand, there is no significant relationship between liquidity and profitability in case of measuring profitability by ROE. So, the public sector banks are perform liquidity management function well that is not effecting profitability of the banks. But the CRDR and IDR have negative relationship on profitability as measured by ROE which is not statistically significant. In spite of that, public sector banks need to take initiative on that. As the non-performing loan amount is so high that is one of the reasons for negative relationship with profitability. On the other hand, there is no significant relationship between liquidity and profitability of DSE listed private sector banks in both cases when the profitability either measure by ROA and ROE. So, the DSE listed private sector banks are performed very well to keep their liquidity position at desired level without effecting profitability. To compare between public sector and DSE listed private sector, the DSE listed private sector banks perform their liquidity management function better than public sector banks. As DSE listed private sector banks' profitability as measured by ROA and ROE, there is no significant relation between liquidity and profitability. So, it is indicated that DSE listed private sector perform very well in terms of liquidity management compare to public sector banks in Bangladesh. Based on the result of the descriptive statistics, the standard deviation of liquidity as measured by CR, CDR, CRDR and IDR of public sector banks are higher than DSE listed private sector banks. On the other hand, the profitability as measured by ROA and ROE of public sector banks are higher than DSE listed private sector banks. So, the public sector banks are more volatile than DSE listed private sector banks in terms of liquidity and profitability. The standard deviation of public sector banks is volatile because some banks liquidity measures are less stable than others banks in public sector especially Rajshahi Krishi Unnayan Bank (RAKUB) and Probashi Kallyan Bank (PKB). So, based on the outcomes of all measures it can be concluded that DSE listed private sector banks are more efficient than public sector banks in terms of liquidity management and maintain profit at a certain level at the same time. The public sector banks should improve their liquidity management function with a standard framework to remain competitive with DSE listed private sector banks in Bangladesh.

7. Findings and Recommendations:

7.1. Findings

The findings of the study regarding the effect of liquidity management on profitability of public sector and DSE listed private sector banks are given below:

1. The profitability as measured by return on assets (ROA) and return on equity (ROE) of public sector banks is found negative through descriptive measures. Because the return on assets and return of equity of some banks in public sector are fluctuated more than others especially the return on assets (ROA) and return on equity (ROE) of Rajshahi Krishi Unnayan Bank (RAKUB) and Probashi Kallyan Bank (PKB) during the five years. The profitability as measured by return on assets (ROA) and return on equity (ROE) of public sector banks is found positive which is good indication of performing well in terms of generating profit by proper utilizing assets and owners' fund of banks.
2. It is found that there is significant relationship between liquidity and profitability of public sector banks when the profitability is measured by return on assets (ROA). As, return on assets ROA is negative for

the public sector banks and the positive relationship is found by regression model. It is indicated that the explanatory variables such as current ratio (CR), cash-deposit ratio (CDR), credit-deposit ratio (CRDR) and investment-deposit ratio (IDR) are influenced profitability positively but not in reality. As, the non-performing loan of the public sector banks is one of the reason of that. In spite of increasing outstanding credit and investment, the return on assets is not increasing at same speed. On the other hand, there is no significant relationship is found between liquidity and profitability of public sector banks when the profitability is measured by return on equity ROE.

3. For the DSE listed private sector banks, it is found that there is no significant relationship between liquidity and profitability in both cases either profitability is measured by return on assets ROA and return on equity ROE. So, it is indicated that the DSE listed private sector banks are performed their liquidity management function well so that the liquidity is not affecting the profitability. In spite of the insignificant relationship between liquidity and profitability, the model has negative relationship with profitability. The DSE listed private sector banks have efficient liquidity management that is the reason behind the insignificant negative relationship between liquidity and profitability. This type of finding is also found by Birajit Mohanty and Shweta Methrotra (2018) for the private sector banks in India. In that study, they found no significant relationship between liquidity and profitability of private sector banks in India as like this study is found the relationship between liquidity and profitability of DSE listed private sector banks in Bangladesh is insignificant.
4. So, the liquidity management of DSE listed private sector banks is more efficient than that of public sector banks. As, DSE listed private sector banks are immunized the liquidity on profitability that is revealed by regression analysis as insignificant relationship between liquidity and profitability (as measured by either ROA or ROE). On the other hand, different results are found for public sector banks. Because of those, it cannot be said that the liquidity management is efficient. Based on the result, the DSE listed private sector banks are ahead of public sector banks in term of liquidity management.

These are the ultimate finding of the study regarding liquidity management and its impact over profitability of public and DSE listed private sector banks.

7.2. Recommendations

The recommendations of the study based on the findings the effect of liquidity management on profitability of public sector and DSE listed private sector banks are given below:

1. The public sector banks need to take corrective measures and steps so that it can improve its return on assets (ROA) and return on equity (ROE). The liquidity management is one of the key areas that need to improve as well. The return on assets and return on equity can also be generating by efficiently allocating the assets of the banks and producing profit with stability. On the other hand, the DSE listed private sector banks' return on assets and return on equity are in positive and they need to continue the growth of turn on assets (ROA) and return on equity (ROE) with taking right steps in right time.
2. As there is significant relationship between liquidity and profitability (as measured by ROA) is found significant for the public sector banks, the banks should take initiative care of that like the banks should keep as much as cash needed to fulfill customer demand and invest and lend funds in the profitable sectors. So, banks can generate more return in terms of assets and equity. On the other hand, the relationship between liquidity and profitability (as measured by ROE) is found insignificant for the public sector banks that is a good indication for the public sector banks' liquidity management.
3. The relationship between liquidity and profitability (as measured by either ROA or ROE) is not significant. This means that the DSE listed private sector banks have efficient liquidity management framework with effective initiatives. The banks need to improve their liquidity management function more so that the insignificant negative relationship between credit-deposit and return on assets (ROA) and return on equity (ROE) is not come to in effect.
4. The comparative result is showed that the DSE listed private sector banks are ahead of public sector banks. So the public sector banks should take initiative so that they can improve their condition. The current ratio (CR), cash-deposit ratio (CDR), credit-deposit ratio (CRDR) and investment-deposit ratio

(IDR) of public sector need to be improved. According to the result, the public sector banks, need to improve their liquidity position by attracting more deposit and invest and lend those funds to the diversified profitable sector. At the same time, the recovery of the loan needs to be ensured so that the non-performing loan is not climbing up more.

These are the recommendations according to finding of the study regarding liquidity management and its impact over profitability of public and DSE listed private sector banks.

8. Conclusion:

This study is all about the effect of liquidity management on profitability of public sector and DSE listed private sector banks and conducts a comparative analysis between these two sectors based on the outcomes. After analyzing, it is found that the liquidity management of DSE listed private sector banks is more efficient than public sector banks. As there is no significant relationship between liquidity and profitability of DSE listed private sector banks based on the data for period 2013 to 2017. The result can be change if the other independent variables included in the model other than included variables in this study. The liquidity growth of the banking industry is in lethargic trend especially from the 2018 and in declined trend. So, the liquidity management plays a crucial role on the present condition. According to the results, it can be said that DSE listed private sector banks are able to face the current condition more better way than public sector banks. So, the public sector banks should take initiatives to improve their liquidation management function at the same time to improve the return on assets and return on equity. So, this study reveals the potential of public sector and DSE listed private sector banks based on liquidity management and its effect on profitability.

Author Contributions: All authors contributed to this research.

Funding: Not applicable.

Conflict of Interest: The authors declare no conflict of interest.

Informed Consent Statement/Ethics Approval: Not applicable.

References

Nicola Cetorelli and Linda S. Goldberge (2012). Liquidity management of U.S. global banks: Internal capital markets in the great recession- Journal of International Economics- Volume 88, Issue 2, November 2012, Pages 299-311

Oluwatobi Fagboyo, Anjola Adeniran and Abayomi Adedeji (2018). Impact of Liquidity Management on Profitability in Nigeria's Banking Sector- Conference: ICGET 2018

At: Baze university, Abuja, Nigeria

Birajit Mohanty and Shweta Mehrotra (2018). The effect of liquidity management on profitability in Indian banking sector- The IUP journal of bank management: IJBM. - Hyderabad : IUP Publ., ISSN 2583-5866, ZDB-ID 2615464-X. - Vol. 17.2018, 1, p. 7-20Bordeleau and Graham (2010).

The impact of liquidity on bank profitability- Bank of Canada Working Paper 2010-38 December 2010

Ali Sulieman Alshantti (2014): The Effect of the Liquidity Management on Profitability in the Jordanian Commercial Banks- International Journal of Business and Management; Vol. 10, No. 1; 2015 ISSN 1833-3850 E-ISSN 1833-8119

Muhammad Shaukat, Mustabsar Awais and Aisha Khursheed (2016): Impact of Liquidity on Profitability: A Comprehensive Case of Pakistan's Private Banking Sector- International Journal of Economics and Finance; Vol. 8, No. 3; 2016 ISSN 1916-971X E-ISSN 1916-9728

Victor Curtis Lartey, Samuel Antwi and Eric Kofi Boadi (2013): The Relationship between Liquidity and Profitability of Listed Banks in Ghana- International Journal of Business and Social Science- Vol. 4 No. 3; March 2013

Sunny Obilor Ibe (2013): The Impact of Liquidity Management on the Profitability of Banks in Nigeri- Journal of Finance and Bank Management 1(1); June 2013 pp. 37-48

Dr. Munther Al Nimer, Dr. Lina Warrad and Dr. Rania Al Omari. (2015): The Impact of Liquidity on Jordanian Banks Profitability through Return on Assets -European Journal of Business and Management www.iiste.org-ISSN 2222-1905 (Paper) ISSN 2222-2839 (Online)-Vol.7, No.7, 2015
Daily Star Newspaper: https://www.thedailystar.net/business/news/liquidity-crunch-intensifying-1742770
Dhaka Tribune Newspaper: Source: https://archive.bangladesh-post.net/banks-facing-liquidity-crisis/
Sonali Bank Limited- Annual Report (2013-17)
Janata Bank Limited- Annual Report (2013-17)
Rupali Bank Limited- Annual Report (2013-17)
Agrani Bank Limited- Annual Report (2013-17)
BASIC Bank Limited- Annual Report (2013-17)
Bangladesh Development Bank Limited (BDBL) - Annual Report (2013-17)
Bangladesh Krishi Bank (BKB)- Annual Report (2013-17)
Rajshahi Krishi Unnayan Bank (RAKUB) - Annual Report (2013-17)
Probashi Kallyan Bank (PKB) - Annual Report (2013-17)
AB Bank Limited- Annual Report (2013-17)
Eastern Bank Limited- Annual Report (2013-17)
Trust Bank Limited- Annual Report (2013-17)
Dhaka Bank Limited- Annual Report (2013-17)
Prime Bank Limited- Annual Report (2013-17)
City Bank Limited- Annual Report (2013-17)
Brac Bank Limited- Annual Report (2013-17)
Pubali Bank Limited- Annual Report (2013-17)
Standard Bank Limited- Annual Report (2013-17)

The Asian Institute of Research
Economics and Business Quarterly Reviews
Vol.7, No.1, 2024: 102-112
ISSN 2775-9237

DOI: 10.31014/aior.1992.07.01.562

Incentivizing Excellence: Evaluating the Impact of Financial and Moral Incentives on Employee Performance in Libyan Governmental Universities

Ghazi M Moftah Elkwafi[1], Figen Yesilada[1]

[1] Department of Business Administration, Cyprus International University, Nicosia, North Cyprus, Turkey

Correspondence: Ghazi M Moftah Elkwafi, Department of Business Administration, Cyprus International University, Nicosia, North Cyprus, Turkey. Tel: +90 531 517 09 88. E-mail: awaab_70@yahoo.com

Abstract
Since the main objective of any organization is to provide the best services and achieve the goals for which it was established, and due to the significant role of financial and moral incentives in influencing the performance of employees to carry out the work assigned to them to reach the objectives of the institution, this study aims to identify the importance of the financial and moral incentives offered to employees of the Libyan governmental universities, the extent of their impact on employee performance, and whether there are clear differences in the opinions of the respondents about the questions of the study according to their personal and functional variables. In order to achieve these objectives, the descriptive approach, based on the study of the relationship as it is in fact, will be used as a detailed description and expression, as it is based on the random sampling of five Libyan government universities by designing a questionnaire and distributing it to a random sample in the universities equally.

Keywords: Financial Incentives, Moral, Incentives, Employee Performance, Libya, Governmental Universities

1. Introduction

Both public and private institutions utilize their human workforce to achieve the short-term and long-term goals of the institution. The performance of these businesses relies on their ability to attract and retain skilled individuals who can effectively carry out their objectives, and the success of these firms is contingent upon the loyalty and commitment of their employees (Ahmed et al., 2013).

Incentives are key to motivating individuals to work. These incentives have attracted considerable attention from scholars studying organizational behavior (Miller & Whitford, 2007). There are two primary classifications of incentives. One category pertains to finances, encompassing wage increases, bonuses, and other monetary rewards

for exceptional performance. Moral incentives, on the other hand, are non-financial and can be implemented through written acknowledgments of gratitude and appreciation towards the workers. (Hussain et al., 2012). Insufficient financial or moral incentives for hardworking employees may undermine their performance, reducing the likelihood of achieving the organization's goals. Moreover, pursuing research to determine effective strategies for various workforce groups is crucial, as incentives differ among organizations depending on their specific operations and job categories (Alnsour & Kanaan, 2021).

An extensive study exists on the impact of financial and moral incentives on the academic staff's performance. However, there is a scarcity of research on this topic, specifically in Libyan public universities. Thus, this study aims to investigate the effect of financial and moral incentives on the performance of academic staff in Libyan public universities and the moderating role of age on the relationship.

2. Literature Review

2.1 Financial Incentives

Public universities rely heavily on financial incentives to retain and motivate their personnel. These establishments strive to strike a harmonious equilibrium between scholarly excellence, investigation, and the fiscal challenges that are customary for the public sector. This research will conduct a comprehensive analysis of the financial incentives provided to personnel at public universities, evaluating their effectiveness, repercussions, and broader framework (Batory & Lindstrom, 2011).

Financial incentives such as salaries, bonuses, and performance-based compensation are potential benefits that public university employees can anticipate. Developing a culture of excellence, motivating academics and staff to excel in their roles, and attracting and retaining exceptional individuals are the objectives of these incentives. However, due to the distinctive nature of public universities, the utilization of financial incentives at these institutions is subject to scrutiny (Andersen & Pallesen, 2008).

The degree to which staff at public colleges are motivated by financial incentives may vary depending on a number of criteria. To commence, research has demonstrated that financial incentives exhibit greater efficacy when they are linked to particular performance indicators of teams or individuals, such as research output, student outcomes, or administrative efficiency. To ensure that public institutions accomplish their objectives and maintain their values, incentive systems must be meticulously designed (Boland, 2020).

Additionally, the entire compensation package provided by the institution may have an impact on the efficacy of monetary incentives. Funding constraints can occasionally impede the ability of public universities to contend with private institutions in terms of fundamental compensation. It is not always necessary to offer monetary incentives to attract and retain top talent when this occurs. Creating a welcoming work environment or providing opportunities for professional development could be equally as effective (Alnsour & Kanaan, 2021).

While financial incentives may potentially enhance employee morale and productivity, they are not devoid of disadvantages. Academic and educational goals, for instance, may become eclipsed by an excessive preoccupation with quantitative metrics when financial incentives are prevalent. With faculty and staff placing a greater emphasis on short-term gains, the university's long-term objective may suffer as a result (Chaix-Couturier et al., 2000).

Financial incentive distribution also carries the risk of being unjust. When some faculty members have greater opportunities to earn money or meet performance objectives than others, pay disparities may result. Prior to implementing incentive programs, public colleges and universities ought to carefully consider the implications for fairness and establish strategies to mitigate disparities (Langdown & Peckham, 2014).

Numerous external factors, including institutional culture, regulatory constraints, and government funding, influence the effectiveness of financial incentives at public colleges. Whether provided by the federal government or individual states, funding for public colleges and universities is susceptible to fluctuations in the economy and

political agendas. The institution's ability to maintain competitive incentive programs may be compromised as a result of this instability (Lee, 2018).

Additionally, a commitment to the public good, academic autonomy, and shared governance are elements of public university heritage and culture. It is critical that financial incentives operate in conjunction with these principles and do not contradict them. Colleges must acknowledge that there are circumstances in which a one-size-fits-all approach is ineffective and consider ways to tailor incentive systems to different academic disciplines and positions (Denning & Turley, 2017).

Financial incentives may be an effective retention and motivational tool for public university personnel when they are meticulously planned and implemented. Their effectiveness is determined, among other things, by their conformity with institutional goals, their regard for equality, and the broader context in which they operate (Oliver & Brown, 2012). To ensure the sustained success of their institutions and personnel, public universities must strike a delicate balance between providing monetary incentives and upholding their core values and curricula. Enhancing the design and optimizing incentive programs for personnel at public universities necessitates further investigation and ongoing evaluation (Link & Siegel, 2005).

2.2. Moral Incentives

Moral incentives, which are alternatively referred to as ethical or intrinsic incentives, have gained traction in recent years as organizations such as businesses and governments seek to motivate and retain employees in ways other than monetary compensation. Fundamental to moral incentives is the synchronization of one's occupation with one's values, beliefs, and sense of direction. The significance of these incentives in fostering a sense of affiliation among faculty and staff with the university, commitment to its pedagogical objectives, and social accountability are critical in the context of public institutions (Elumah Lucas et al., 2016).

Public colleges are exceptional institutions due to their non-commercial nature and distinct philosophy and objectives. These establishments frequently serve as catalysts for societal change, information distribution, and community development. Given the imperative to cultivate the intrinsic motivations of individuals drawn to academia for purposes beyond monetary compensation, moral incentives assume heightened importance within these particular contexts (Al-Nsour, 2012).

Public colleges inherently promote academic independence and intellectual curiosity as fundamental incentives. The faculty members' engagement and enthusiasm for their work stem from the exploration of novel concepts, the interrogation of established beliefs, and the contribution to the corpus of knowledge. Public institutions uphold these ideals, fostering an environment in which faculty members are liberated to pursue their academic pursuits without apprehension of reprisal (Obeidat & AL-Dwairi, 2015).

Public colleges are founded on the principle of delivering services that are advantageous to the broader populace. Employees are motivated by the opportunity to effect positive change in the world through their engagement in research, education, and community service. This ethical motivation enhances the sense of affiliation among public university personnel with the organization's mission and the broader society (Hussain et al., 2012).

Public college employees are frequently motivated by a profound sense of social responsibility. They consider healthcare, sustainability, and inequality to be among the most pressing social issues that demand their specialized knowledge and skills as administrators, researchers, and educators. Employees are driven to seek solutions and effect positive change in society due to the moral incentive at play (Williams, 1998).

For many faculty members, mentoring students and observing their academic and personal growth provides them with moral satisfaction. Teachers possess a profound dedication to their profession due to the ethical obligation they bear to shape the future generations (Dechenaux et al., 2011).

Public colleges make it difficult to implement moral incentives, despite the numerous benefits that such an approach offers. Public colleges and universities have an obligation to foster and cultivate an environment that acknowledges the significance of such incentives (Bursztyn et al., 2019). This includes fostering an inclusive and welcoming academic environment that embraces all students, recognizing and appreciating endeavors that adhere to ethical standards, and providing opportunities for faculty and staff to effect positive change on a global scale (Collier & Venables, 2014).

In addition to financial considerations, moral incentives are significant factors in stimulating and involving personnel at public colleges. Public university faculty and staff may cultivate a profound sense of affiliation, commitment, and societal accountability when their personal convictions, ethical standards, and incentives align with the mission and goals of the institution (Bursztyn et al., 2019). In order to preserve the unique contributions of these institutions to education and society amidst constant change, it will be necessary to foster and enforce moral incentives. To better comprehend how moral incentives function and their effects in public university environments, additional research is required in this area (Bowles, 2016).

2.3. Employee Performance

As organizations and businesses seek to motivate and engage their employees in ways other than monetary compensation, the concept of moral incentives—also known as ethical or intrinsic incentives—has gained traction in recent years. The essence of moral incentives is when an individual's occupation corresponds with his or her values, principles, and sense of direction. Public institutions rely heavily on the applicability of these incentives to foster a sense of affiliation among faculty and staff, commitment to the institution's pedagogical objectives, and social accountability (Elumah Lucas et al., 2016).

Since they are not for profit and have a distinct philosophy and objective, public colleges are unique environments. Frequently, these establishments facilitate community development, impart knowledge, and advance societal transformation. In such contexts, moral incentives assume greater significance due to the imperative of nurturing the intrinsic motivations of individuals drawn to academia for purposes beyond monetary compensation (Al-Nsour, 2012).

Public colleges inherently promote and encourage academic independence and intellectual curiosity. Faculty members remain enthusiastic and engaged in their work through the exploration of novel concepts, the interrogation of established beliefs, and the contribution to the collection of knowledge. Public institutions foster an environment wherein faculty members are indemnified from apprehension regarding reprisal, thereby upholding these ideals (Obeidat & AL-Dwairi, 2015).

Delivering services that benefit the general populace is the fundamental purpose of public colleges. The opportunity to effect global change through research, education, or community service is what motivates personnel. This moral motivation fosters a stronger sense of affiliation among public university personnel with the institution's mission and the broader welfare (Hussain et al., 2012).

Employees of public colleges are frequently motivated by a profound sense of social responsibility. As administrators, researchers, and educators, they consider inequality, healthcare, and sustainability to be among the most significant social issues that demand their specialized knowledge. The presence of this moral motivation inspires employees to seek solutions and effect positive change in society (Williams, 1998).

A number of faculty members derive moral satisfaction from mentoring students and observing their academic and personal growth. Due to the moral obligation to shape the lives of forthcoming generations, educators exhibit profound dedication to their profession (Dechenaux et al., 2011).

While moral incentives offer numerous benefits, their implementation is hindered by the infrastructure of public colleges. Promoting and cultivating a culture that acknowledges the significance of these incentives falls within the purview of public colleges and universities (Bursztyn et al., 2019). This consists of providing opportunities for

faculty and staff to make a positive impact on the world, fostering an inclusive and welcoming learning environment for every student, and recognizing efforts that adhere to ethical standards (Collier & Venables, 2014).

In the realm of public college staff motivation and engagement, moral incentives hold significant sway over financial considerations. When the beliefs, ethics, and motivations of faculty and staff at public universities align with the purpose and objectives of the institution, they may cultivate a profound sense of affiliation, commitment, and social accountability (Bursztyn et al., 2019). Moral incentives will need to be fostered and enforced in order to preserve the unique contributions of these institutions to education and society amidst constant change. Additional research is required to elucidate the mechanisms and consequences of moral incentives within public university environments (Bowles, 2016).

3. Study Methodology

The purpose of this research is to determine whether or not financial and moral incentives have a positive impact on staff performance at publicly funded institutions in Libya. As a result of the extensive review of the literature, the research model of the study was developed (Figure 1).

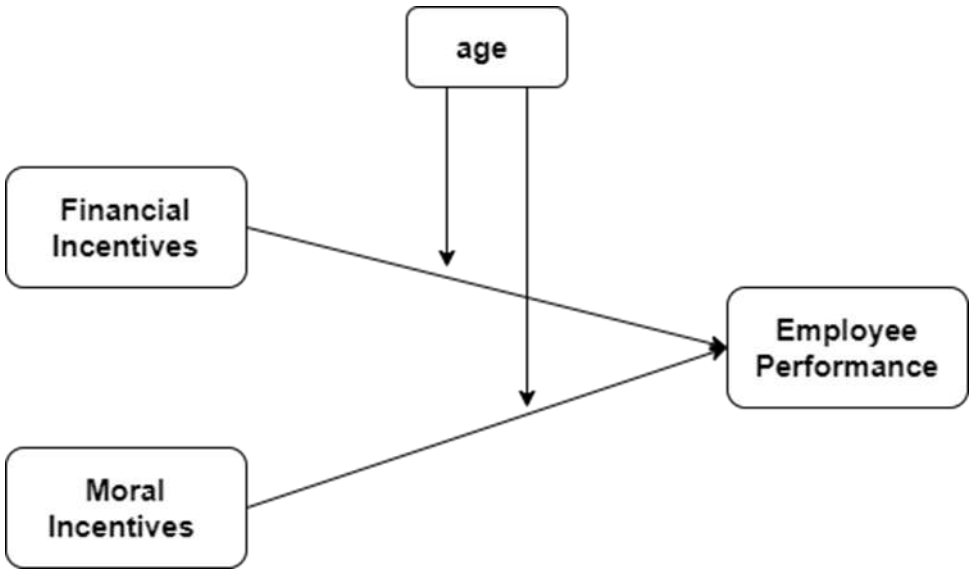


Figure 1: Research Model

The hypotheses of the study are as follows:

1. There is a positive and statistically significant effect of financial incentives on employee performance
2. There is a positive and statistically significant effect of moral incentives on employee performance
3. Age has a moderating role in the relationship between financial incentives and employee performance
4. Age has a moderating role in the relationship between moral incentives and employee performance

The total population consists of faculty members, department chairs, general administration staff, and directors of Libyan institutions. Data was collected from 5 universities: Tripoli, Benghazi, Sebha, Omar Al-Mukhtar, and Al-Zawiya in Libya. The sample size was determined as 400 and convenience sampling was used as the sampling technique.

After building a first-level CFA model, the AMOS 23.0 tool was used to assess the factors. Latent variables were obtained by using confirmatory factor analysis "CFA" to align the model with the data, which was based on a few metrics. The moderator variable's influence on the relationship between the dependent variables and the independent variable was determined using Structural Equations Modelling "SEM," and the direct link between the latent variables was also determined.

4. Result and Discussion

4.1. Reliability and Convergent Validity

The consistent and reliable nature of the sample's findings was demonstrated by the high reliability scores. The effectiveness of the questionnaire, its internal consistency, and the correspondence between expected and actual values were all evident, as all examined reliability criteria exceeded 70%. (Table 1).

Table 1: Reliability test

	FI	MI	EP
Cronbach Alpha	0.7498228	0.715138	0.7213521
Ave	0.5402369	0.5751959	0.5468516

4.2. Confirmatory Factor Analysis (CFA)

Even after conducting a conformity factor analysis (CFA) on the equations using the program, the outcomes remained unchanged. The subsequent model (Table 2, Figure 2) was obtained by excluding the variables that had the most significant influence on the overall variance of the model.

Table 2: Conformity factor analysis (CFA)

Fit indices	Recommended out of value	Research Model Value
X^2 /df	1 – 5	3.473
P.value	< 0.05	0.000
GFI	>0.8	0.925
CFI	>0.9	0.997
RMSEA	< 0.08	0.079
SRMR	<0.06	0.046

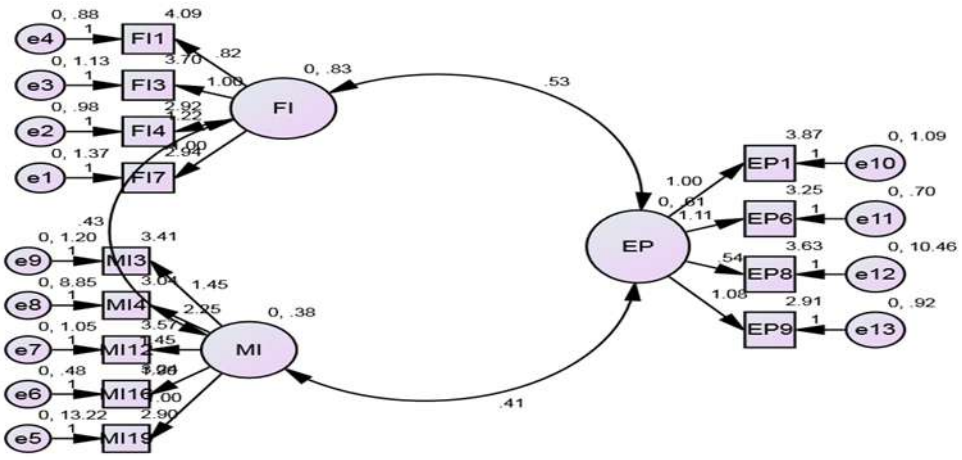


Figure 2: Conformity factor analysis model

4.3. Structural Equation Model (SEM)

Following the validation of the factor structures, the validity of the investigated scale was also ascertained. From this vantage point, SEM analysis will be initiated in order to examine the hypotheses.

As shown in Table 3, each of the measurements was identical. In cases where alternative criteria indicated that the model was interpretable and a satisfactory fit was achieved, but only one of the SEM estimation fit criteria yielded an acceptable outcome, the model was deemed adequate.

Table 3: Measurement (Fit Statistics)

Measurement (Fit Statistics)	Good Fit	Research Model Value	Compliance Status
General Model Fit			
X^2 /df	1 – 5	3.94	Good fit
Comparative Fit Statistics			
NFI	>0.95	0.96	Good fit
TLI(NNFI)	>0.95	0.953	Good fit
IFI	>0.95	0.989	Good fit
CFI	>0.95	0979	Acceptable
RMSEA	<0.08	0.03	Good fit
Absolute Fit Indices			
GFI	>0.95	0.951	Good fit
AGFI	>0.95	0.961	Good fit
Residual Compliance Index			
RMR	<0.05	0.0425	Good fit

Table 4 presents the findings that financial incentives influence employee performance positively by 33 percent, whereas moral incentives exert a more substantial positive influence of 87.1 percent. H1 and H2, which comprise the model's principal hypotheses, were validated.

Table 4: Results of the Relationship Between the Financial and Moral Incentives and Employee Performance

Structural Relationship	Direction	Estimated coefficient	Std. Error	t statistic	p	Result
EP~FI	+	0.329	0.057	5.77	0.000	Significant
EP~MI	+	0.871	0.303	2.876	0.004	Significant

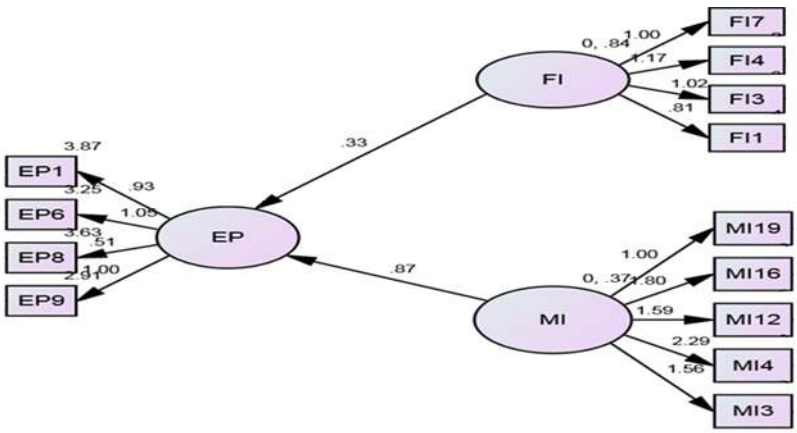


Figure 3: SEM model of the H1 and H2 hypothesis

4.4. The moderating variables

The findings suggest that age functions as a "pure moderator" in relation to the beneficial impact of FI and MI on EP. Thus, the third and fourth hypotheses were validated.

Table 5: Results of the Relationship Between the Financial and Moral Incentives and Employee Performance in terms of Age

Moderating Variable	Structural Relationship	Estimated coefficient	Std. Error	t statistic	p	Result
Age	FI ~ EP	-0.366	0.115	-3.175	0.001	H3: Accepted
Age	MI ~ EP	-0.245	0.101	-2.432	0.015	H4: Accepted

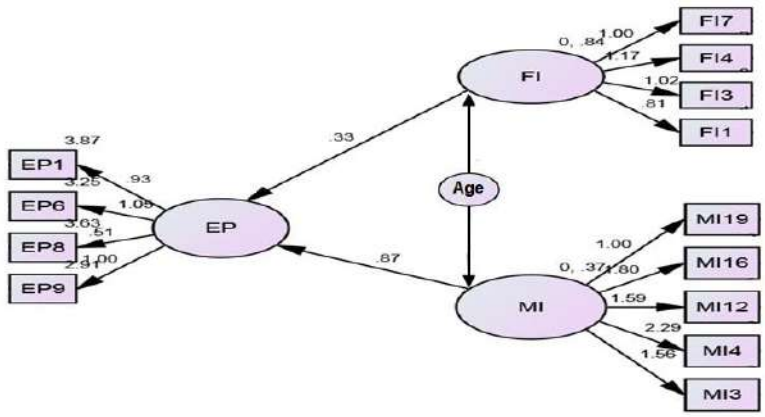


Figure 4: SEM model of the H3 and H4 hypothesis

4.5. Discussion

The results of the study show that both financial and moral incentives have a significant effect on employee performance.

Moral incentives motivate individuals to behave in an ethical manner and with a sense of purpose through the appeal to their intrinsic motivations and ideals. Employees whose values and job purpose are congruent are more likely to be invested in their work, leading to increased productivity and motivation.

In contrast, financial incentives represent a form of extrinsic motivation wherein tangible rewards are provided in exchange for specific performance objectives. Incentives such as monetary prizes, pay increases, and bonuses induce employees to perform admirably on the job in an immediate and conspicuous manner. Due to the fact that competitive compensation packages are a significant draw for prospective employees, monetary incentives are crucial for retaining and recruiting talent.

The effectiveness of various types of incentives may differ based on personal preference, the particulars of the position, and the corporate culture. Others may be more committed to the ethical aspects of their work, whereas some employees may prioritize the monetary perks. Thus, organizations can effectively foster and retain a diverse workforce through the integration of financial and ethical motivations.

Businesses should ultimately seek a balance between the two incentives, since they are not mutually exclusive. Organizations can foster a conducive work environment that promotes exceptional employee performance and commitment by aligning their values with those of the organization and providing opportunities for financial growth and stability. On the other hand, Tripathi (2014) examined the effects of monetary incentives on the productivity of university personnel.

Age has a moderating role in the relationships between both moral incentives and financial incentives and employee performance.

Within the framework of governmental universities in Libya, age significantly affects the effect of financial and moral incentives on employee performance. The aforementioned effect is subject to the distinct attributes of the academic milieu in Libya as well as the more extensive socioeconomic circumstances that prevail within the nation.

Younger members of the faculty and staff, frequently in the early stages of their professional journeys, might be especially susceptible to financial incentives as a result of pressing financial responsibilities and needs. These individuals may be confronted with the obligation of repaying student loans or providing for their families. Competitive remuneration and performance-driven incentives may serve as compelling incentives that have a positive impact on their overall performance.

With increased stability and experience, faculty and staff in the middle of their careers may find it possible to reconcile financial and moral incentives. Although individuals continue to prioritize financial stability and may pursue tenure or long-term contracts, their emphasis is shifting towards greater job satisfaction and alignment with the mission of the university. At this stage in their careers, prospects for professional development and a sense of making a meaningful contribution to the educational objectives of the university emerge as critical motivators.

Faculty members nearing retirement from their late careers may possess a wealth of institutional expertise and experience. Moral incentives, including mentoring junior colleagues, participating in curriculum development, and making an enduring contribution to the university, may serve as drivers of their motivation. Nevertheless, monetary incentives associated with retirement packages and prospects after retirement can also exert a significant impact.

Government universities in Libya frequently encounter financial and budgetary restrictions that may impede their access to financial incentives. As a response, it is advisable for these establishments to contemplate a well-rounded strategy that accommodates the requirements and incentives of personnel at various phases of their professional timelines. This may encompass competitive remuneration packages for professionals in their early stages of professional careers, opportunities for mid-career staff to advance their careers and receive recognition, and recognition for the mentorship and contributions of faculty members in their later years.

The significance attributed to education and community in the wider Libyan culture may influence the manner in which employees react to moral incentives. Employees might be highly motivated to contribute to the improvement of society and the education system, as this is consistent with the societal values prevalent in Libya. Moreover, the manner in which incentives are perceived in Libyan universities significantly influences employee morale and performance in terms of fairness and equity.

In conclusion, it is critical to acknowledge the moderating influence of age in governmental universities in Libya in order to develop incentive programs that successfully inspire personnel at different points in their careers. It is imperative that these programs demonstrate adaptability towards the distinct socio-economic circumstances, cultural norms, and financial limitations of the nation. By doing so, they will ultimately support improved employee productivity and the universities' educational objectives.

5. Conclusion

Since 1981, in accordance with Law No. 15, all sectors of the state have been paid equally. Minimum fundamental wage (3180 Libyan dinars annually). Legislation No. 15 sanctioned the payment of monetary incentives and benefits. Incentives were restricted to the following: family incentives, delegation incentives, overtime incentives, teaching incentives, scholarship and study course incentives. Furthermore, the legislation approved the provision of incentives in addition to the base salary to differentiate certain positions. In response to economic fluctuations and changes in global prices, certain sectors increased the distribution of these incentives in an effort to motivate employees to improve their performance. Following the events of February 17, 2011, Law (27) for the year 2011

was promulgated, which amended salaries to establish the minimum basic wage for all state sector employees (5400 Libyan dinars annually).

This amendment failed to consider the inter-sectoral administration of justice and economic conditions. Certain sectors that adhere to legislative authority have garnered attention for their significantly higher wages compared to workers in other sectors. For instance:

The rudimentary minimum wage for personnel within the Audit Bureau industry (9840 Libyan dinars annually). The bare minimum wage for personnel employed at the Cabinet Office (9000 Libyan dinars annually). The discrepancy in wages across sectors, despite the similarity of the jobs, has generated an urgent need for incentive spending to promote fairness and motivation among workers in different industries, as well as a reevaluation of the policy regarding salary recognition by establishing unified standards for state sector employees.

The productivity of public college employees in Libya is found to be correlated significantly with moral incentives. Once more, the sole motivating factor is the differentiation. As a result, public universities must reevaluate their human resources policies and the determinants of employee performance, as this directly affects the organization's financial health and overall viability.

The research proposes several modifications that would enhance public universities. These include the implementation of sufficient gratuity programs and additional ancillary benefits, the development of appealing compensation and benefits packages, the provision of group performance-based incentives, and the clarification of retirement schemes.

Author Contributions: The following statements should be used "Conceptualization, G.E. and F.Y.; Methodology, G.E.; Software, G.E.; Validation, G.E.; Formal Analysis, G.E.; Investigation, G.E.; Resources, G.E.; Data Curation, G.E.; Writing – Original Draft Preparation, G.E.; Writing – Review & Editing, G.E. and F.Y.; Visualization, G.E.; Supervision, F.Y.; Project Administration, F.Y.; Funding Acquisition, G.E".

Funding: This research received no external funding.

Conflicts of Interest: The authors declare no conflict of interest.

Informed Consent Statement/Ethics approval: All participants were fully informed that the anonymity is assured, why the research is being conducted, how their data will be used and if there are any risks associated.

References

Ahmad, S., & Shahzad, K. (2011). HRM and employee performance: A case of university teachers of Azad Jammu and Kashmir (AJK) in Pakistan. *African journal of business management*, *5*(13), 5249.

Ahmed, I., Sultana, I., Paul, S. K., & Azeem, A. (2013). Employee performance evaluation: A fuzzy approach. *International Journal of Productivity and Performance Management*, *62*(7), 718-734.

Ali, S., & Farooqi, Y. A. (2014). Effect of work overload on job satisfaction, effect of job satisfaction on employee performance and employee engagement (a case of public sector University of Gujranwala Division). *International Journal of Multidisciplinary Sciences and Engineering*, *5*(8), 23-30.

Alnsour, A., & Kanaan, O. (2021). The effects of financial and non-financial incentives on job tenure. *Management Science Letters*, *11*(3), 729-736.

Al-Nsour, M. (2012). Relationship between incentives and organizational performance for employees in the Jordanian Universities. *International journal of business and management*, *7*(1), 78.

Andersen, L. B., & Pallesen, T. (2008). “Not just for the money?” How financial incentives affect the number of publications at Danish research institutions. *International Public Management Journal*, *11*(1), 28-47.

Batory, A., & Lindstrom, N. (2011). The power of the purse: Supranational entrepreneurship, financial incentives, and European higher education policy. *Governance*, *24*(2), 311-329.

Boland, W. C. (2020). Performance funding and historically black colleges and universities: An assessment of financial incentives and baccalaureate degree production. *Educational Policy*, *34*(4), 644-673.

Bowles, S. (2016). *The moral economy: Why good incentives are no substitute for good citizens*. Yale University Press.

Bursztyn, L., Fiorin, S., Gottlieb, D., & Kanz, M. (2019). Moral incentives in credit card debt repayment: Evidence from a field experiment. *Journal of Political Economy*, *127*(4), 1641-1683.

Chaix-Couturier, C., Durand-Zaleski, I., Jolly, D., & Durieux, P. (2000). Effects of financial incentives on medical practice: results from a systematic review of the literature and methodological issues. *International Journal for Quality in Health Care*, *12*(2), 133-142.

Collier, P., & Venables, A. J. (2014). Closing coal: economic and moral incentives. *Oxford Review of Economic Policy*, *30*(3), 492-512.

Dechenaux, E., Thursby, J., & Thursby, M. (2011). Inventor moral hazard in university licensing: The role of contracts. *Research policy*, *40*(1), 94-104.

Decramer, A., Smolders, C., & Vanderstraeten, A. (2013). Employee performance management culture and system features in higher education: relationship with employee performance management satisfaction. *The International Journal of Human Resource Management*, *24*(2), 352-371.

Denning, J. T., & Turley, P. (2017). Was that SMART?: Institutional financial incentives and field of study. *Journal of Human Resources*, *52*(1), 152-186.

Elgelal, K. S. K., & Noermijati, N. (2015). The influences of transformational leaderships on employees performance (A study of the economics and business faculty employee at University of Muhammadiyah Malang). *APMBA (Asia Pacific Management and Business Application)*, *3*(1), 48-66.

Elumah Lucas, O., Ibrahim Olaniyi, M., & Shobayo Peter, B. (2016). The impact of financial and moral incentives on organizational performance: A study of Nigerian universities. *Arab. J. Bus. Manag. Rev*, *6*(2).

Hussain, R. I., Shah, R. T., & Raza, M. H. (2012). Relationship between incentives and organizational performance for employees in the Pakistani universities. *International Journal of Asian Social Science*, *2*(11), 2027-2033.

Inuwa, M. (2016). Job satisfaction and employee performance: An empirical approach. *The Millennium University Journal*, *1*(1), 90-103.

Langdown, C., & Peckham, S. (2014). The use of financial incentives to help improve health outcomes: is the quality and outcomes framework fit for purpose? A systematic review. *Journal of Public Health*, *36*(2), 251-258.

Lee, K. J. (2018). Strategic human resource management for university-industry collaborations in Korea: financial incentives for academic faculty and employment security of industry liaison offices. *Technology Analysis & Strategic Management*, *30*(4), 461-472.

Link, A. N., & Siegel, D. S. (2005). Generating science-based growth: An econometric analysis of the impact of organizational incentives on university–industry technology transfer. *European Journal of Finance*, *11*(3), 169-181.

Miller, G. J., & Whitford, A. B. (2007). The principal's moral hazard: Constraints on the use of incentives in hierarchy. *Journal of Public Administration Research and Theory*, *17*(2), 213-233.

Obeidat, O., & AL-Dwairi, K. M. (2015). The role of the financial and moral incentives on employees' performance in academic libraries: Case study of Jordan. *International Journal of Library and Information Science Studies*, *1*(1), 12-26.

Oliver, A., & Brown, L. D. (2012). A consideration of user financial incentives to address health inequalities. *Journal of health politics, policy and law*, *37*(2), 201-226.

Ridwan, M., Mulyani, S. R., & Ali, H. (2020). Improving employee performance through perceived organizational support, organizational commitment and organizational citizenship behavior. *Systematic Reviews in Pharmacy*, *11*(12).

Rinny, P., Purba, C. B., & Handiman, U. T. (2020). The influence of compensation, job promotion, and job satisfaction on employee performance of Mercubuana University. *International Journal of Business Marketing and Management (IJBMM)*, *5*(2), 39-48.

Shields, J., Brown, M., Kaine, S., Dolle-Samuel, C., North-Samardzic, A., McLean, P., ... & Robinson, J. (2015). *Managing employee performance & reward: Concepts, practices, strategies*. Cambridge University Press.

Wanza, L., & Nkuraru, J. K. (2016). Influence of change management on employee performance: A case of university of Eldoret, Kenya. *International Journal of Business and Social Science*, *7*(4), 190-199.

Williams, A. (1998). Incentives, inequality, and publicity. *Philosophy & public affairs*, *27*(3), 225-247.

Economics and Business Quarterly Reviews

Ahmed, N. S. H., Atan, T. & Yeşilada, F. (2024). The Effect of Organizational Learning and Knowledge Management in Innovation in SMEs: Study on the Machinery Production Companies. *Economics and Business Quarterly Reviews*, 7(1), 113-126.

ISSN 2775-9237

DOI: 10.31014/aior.1992.07.01.563

The online version of this article can be found at:
https://www.asianinstituteofresearch.org/

Published by:
The Asian Institute of Research

The Asian Institute of Research *Economics and Business Quarterly Reviews* is a peer-reviewed International Journal. The journal covers scholarly articles in the fields of Economics and Business, which includes, but are not limited to, Business Economics (Micro and Macro), Finance, Management, Marketing, Business Law, Entrepreneurship, Behavioral and Health Economics, Government Taxation and Regulations, Financial Markets, International Economics, Investment, and Economic Development. As the journal is Open Access, it ensures high visibility and the increase of citations for all research articles published. The *Economics and Business Quarterly Reviews* aims to facilitate scholarly work on recent theoretical and practical aspects of Economics and Business.

ASIAN INSTITUTE OF RESEARCH
Connecting Scholars Worldwide

The Asian Institute of Research
Economics and Business Quarterly Reviews
Vol.7, No.1, 2024: 113-126
ISSN 2775-9237

DOI: 10.31014/aior.1992.07.01.563

The Effect of Organizational Learning and Knowledge Management in Innovation in SMEs: Study on the Machinery Production Companies

Nouri Shaeban Hasan Ahmed[1], Tarık Atan[2], Figen Yeşilada[3]

[1] Department of Business Administration, Cyprus International University, Nicosia, North Cyprus, Turkey
[2] Professor, Department of Business Administration, Cyprus International University, Nicosia, North Cyprus, Turkey
[3] Associate Professor, Department of Business Administration, Cyprus International University, Nicosia, North Cyprus, Turkey

Correspondence: Nouri Shaeban Hasan Ahmed, Department of Business Administration, Cyprus International University, Nicosia, North Cyprus, Turkey. Tel: +905364728085. E-mail: Nurialzwi16@yahoo.com

Abstract
Researching this topic in SMEs is important because it may help SMEs become active players in accessing regional, national, and international markets through organizational learning, knowledge management, and innovation. In addition, there is a perceived knowledge vacuum due to the dearth of research on the interplay of these three factors in the canonical American literature. This research establishes a theoretical connection between innovation, knowledge management, and organizational learning. This research focused on medium and small-sized businesses in Libya that produce metal goods and machinery. On the other hand, it sheds light on how the connection between organizational learning, knowledge management, and innovation may be applied to businesses of varying sizes and in a variety of industries. This might spark some fresh inquiry, so the thinking goes. They should recognize the significance of their role in regulating free market competition and stimulate innovation in firms by giving priority to the impact of innovation in generating excellent service on the performance of employees. By taking this tack, we can foster a healthy level of competition while also elevating the value of innovation within companies. It is recommended that job-seeking employees give preference to businesses where learning has priority because of the positive effects that collective learning awareness in learning organizations and the idea of being open to learning have on employee performance.

Keywords: Organizational Learning, Knowledge Management, Innovation, SMEs, Machinery Production Companies.

1. Introduction

New market conditions created by globalization and rapid and continuous change in information technology have caused businesses to face fierce competition conditions. These conditions have also required businesses to adapt

to changing environmental conditions and to design their structures, strategies and systems to meet environmental needs. While businesses design their structures and strategies according to the changing needs and expectations of the environment, they have also had to plan how and by what methods they will acquire and develop company-specific resources and capabilities (Deshpandé et al., 1993). Changes in the environment and technology have made competitive conditions more uncertain and unpredictable. As a result, companies have begun to lose their power to provide competitive advantage, even if their existing resources and capabilities are distinctive. In this turbulent and complex period, the survival of companies and their ability to gain sustainable competitive advantage depends on transforming their core competencies into dynamic capabilities that can create strategic value. In order to gain dynamic capabilities, it is of great importance for companies to develop their learning capabilities in a way that also supports their technological innovation capabilities (Calantone et al., 2002).

Organizational learning is an increasingly important capability in a volatile market environment under the influence of turbulent and dynamic conditions. These conditions have transformed knowledge into a key concept. Organizational learning capability is all organizational and managerial practices that facilitate the learning process. Organizational learning capability supports organizations in acquiring knowledge and experience, transfer and integration of knowledge, and therefore continuous learning. Since organizational learning ability also supports adaptation to the external environment, it contributes to a more realistic prediction of possible opportunities and threats created by environmental uncertainty and change (Choi & Lee, 2002). Technological innovation capability has become one of the minimum conditions of competition for almost all industries and market segments. Because companies' ability to gain competitive advantage depends on combining organizational resources with technological innovation. The increasing pressure of global competition, decreasing product life cycle and ease of imitation require companies to innovate in order to maintain their competition. Therefore, companies have had to increase their innovation capabilities and improve their technological innovations in order to develop and commercialize new technologies (Hu et al., 2009).

Organizational learning is the main source of asset protection and development for all organizations, regardless of their field of activity, size and capital structure. Organizational learning is of greater importance for SMEs, which are looking for a market gap suitable for their existing resources and experience, especially in the product market segment they are in (Dasgupta & Gupta, 2009). For SMEs, which are constantly in search of both market and innovation, gaining new knowledge and understanding along with organizational learning has become the driving force of technological development. In contrast to the advantages of large and established enterprises in developing technological innovation, especially in terms of resource provision, SMEs face various disadvantages such as lack of capital, low market share and affecting a limited part of the market. Despite these disadvantages, SMEs can act more effectively and flexibly in the small-scale but privileged product market that can make a difference, which is outside the core capabilities of experienced and large-scale enterprises operating in the main market or that is not profitable for large enterprises (Yu et al., 2017). In addition, meeting the raw material needs of the main market and the production of complementary or intermediate products are largely provided by SMEs. SMEs, with their flexible and entrepreneurial features, take part in the multidimensional broad network structure of the main market as a supplier, producer or service provider, and within this network structure, they can access new market opportunities and become a global player. This reveals that SMEs can protect their assets if they are flexible and innovative. On the other hand, it has been observed that studies on organizational learning and technological innovation are generally based on findings obtained from large-scale companies. On the other hand, the limited number of studies investigating the relationship between organizational learning and firm performance of SMEs shows that there is a research gap on the subject (Noruzy et al., 2013). The fact that organizational learning, knowledge management and innovation can contribute to SMEs becoming active players in accessing both regional, national and international markets has increased the importance of researching the subject in SMEs.

In addition, although many empirical studies have been conducted on organizational learning ability, technological innovation ability and firm performance, there has been little consensus on the relationship between the three variables due to their multidimensional nature. It has also been found that there is a dearth of research on how organizational learning capacity mediates the connection between technical innovation capacity and business performance. In addition, the limited number of studies examining the relationship between these three variables in the domestic literature has been considered as a research gap. In this context, the study conceptually determines

the relationship between organizational learning and knowledge management and innovation. The study was conducted on small and medium-sized manufacturing companies in the metal products and machinery occupational groups in Libya. On the other hand, it provides insight into the applicability of the relationship between companies' organizational learning, knowledge management and innovation to companies of different scales and sectors. It is thought that this situation may encourage new research.

2. Literature Review

In order for organizational learning to occur, individuals and teams must share their mental models as well as their emotions; The organization must improve itself in the processes of acquiring, using and disseminating information. As a result of these efforts, synergy is created. Organizational learning emerges as a result of this synergy and provides greater output compared to both individual and group learning outcomes. The concept of learning organization, which was first put forward for businesses, began to be evaluated in schools, which are considered one of the most important institutions of learning, in the following years (Liao & Wu, 2010). The amount of knowledge that humanity has access to today is far above the level that can be taught by transferring it. For this reason, attention is mainly focused on accessing information rather than information transfer. School organizations basically aim to make education and training services more effective. School is an organization that is directly involved in the learning process, but in such organizations there is an imbalance between teaching and teaching purposes. The school has an organizational structure that mainly teaches. On the other hand, school is an organization that must learn as much as it teaches. In order for the school to have a learning structure, significant changes are needed in the school philosophy and culture. Education is a process that begins with the birth of a person and continues until the end of life (Stata, 1989). The education received in youth can affect individuals' educational futures and changes in their personalities, as well as on their ideas and habits. The International Commission for the Development of Education has stated that lifelong learning is the most important element in reaching the educational society. In order for this to happen, educational institutions must first transform into learning organizations. In this direction, teacher-student roles will also change and the student is expected to play a more active role in his own development process. Within the scope of this change, teachers should use many resources in the school to increase classroom capacity. Teachers should learn in groups in accordance with the staff development policy followed by the school. To have a learning organization strategy, three complementary strategies are needed (Abdi et al., 2018).

Thanks to information, organizations understand how they need to do the job and how they can run the job better. Necessary and accurate information helps the organization get ahead of its competitors by assisting in strategic decisions. Information constantly provides advantages (Sanz-Valle et al., 2011). With knowledge, earnings increase and the advantages continue. Knowing more is always more advantageous than knowing less. It may be thought that less information has clearer and more distinct boundaries, but this does not guarantee that better decisions will be made (Uddin et al., 2016).

It is a comprehensive management practice carried out to achieve positive business results by increasing the intellectual capital of the business. Information management effectively organizes people's experience, expertise, talent, thought, dedication, innovation, tendency, practice, idea, dream and competence, and directs the energy created by organizational and personal practices that benefit from these into the organization and organizes the situations that are considered as part of news sources in order to achieve the organization's goals (Antunes & Pinheiro, 2020). It is an act of integration. This approach is used to increase the market value of the company, manage information in different ways and gain competitive advantage. In addition, knowledge management strives to make knowledge productive in areas such as obtaining, sharing, developing and using productive knowledge in order to increase company performance. One of the areas where competition is fiercest is the production and use of information. To be relevant and competitive in today's market, companies need to know what their people are good at and how to put that information to use (Pérez López et al., 2004).

In line with the organization's objective, information management seeks to consistently enhance organizational performance, efficiency, and production level (Schneckenberg et al., 2015). At the same time, supporting

innovations and new knowledge production is one of the goals of knowledge management. These goals can be achieved by increasing the level of participation and cooperation within the organization and making teamwork possible. Today, the information society has created a very deep competitive environment in terms of both organizational and employee profiles. This situation has brought with it new management approaches and different organizational structures. Due to the qualitative differences in the workforce, different management styles and organizational structures are also on the agenda. On the other hand, these innovations are not only due to the differentiation in the workforce, but are also largely supported by the necessity of gaining competitive advantage in issues such as speed, cost and quality (Nouri et al., 2017).

Organizational structures and management processes must be overhauled for successful information management. Some authors argue that this type of change should be much more radical than the concepts of Reengineering and Total Quality Management (Martin & Matlay, 2003). Experts with this idea believe that information management is the only valid solution in the current economic order. For this reason, in addition to the management approach, business processes and organizational structure must also change radically in accordance with the new understanding. In order to survive in the information economy, organizations must constantly produce and develop new information and use the information produced in the most efficient way. For this, an organizational structure and culture that will encourage continuous knowledge production and innovation and is open to development is needed (Khan & Khan, 2019). Every product, process, and service offered by an organization should incorporate the accumulated wisdom of its members. Achieving and maintaining a sustainable competitive edge will be challenging for the business if the relevant information cannot be easily obtained in the proper manner. These days, businesses can't afford to ignore their workers' vast stores of information if they want to stay relevant and competitive. Instead, they should cultivate and reap the benefits of these ideals. New products and services are made possible through innovations, which also cause shifts in the market's economic dynamics (Abbas et al., 2020). Deshpande, Fearley and Webster (1993) conducted a study on 50 businesses in Tokyo to analyze the relationships between customer orientation, innovation, business performance and common culture. The study results showed that the main determinants of business performance are customer orientation and innovation. In addition, it was concluded that organic culture and market culture were associated with good performance, while hierarchical and clan cultures were associated with poor performance. Innovative organizational culture is essential for businesses that want innovation. In order to create an innovative organization, first of all, an organizational structure suitable for innovation, innovation symbols, ceremonies that reward innovative behavior, and an institutionalized innovation management and control system are needed. In addition, continuous training and development opportunities should be provided for employees at all levels (Walker, 2016).

The segment that is the recipient of the service tends to constantly demand better in the face of all the negativities that may be encountered. Due to this situation, businesses should pay attention to their performance. The performance level of the business is determined by the level at which the business can realize the benefit and economic value demanded from it with its existing resources (Nawab et al., 2015). Therefore, if the obtained value is below the targeted value, it is considered as low performance. If the obtained value is more than the targeted value, it is considered high performance. In this case, for businesses with normal or high performance values, maintaining the current performance value in the following periods is sufficient. On the other hand, if the performance level is low, studies should be carried out to increase performance by investigating the source of the problems and producing solutions (King, 2009). High levels of performance are essential for the survival of any firm, whether it is a public or private sector enterprise, in today's highly competitive market. None of the parts makes up the whole that is the company and its workers. This is why employee achievement on an individual level is a key performance indicator for any given business. In other words, having high-performance people is crucial for firms to achieve their goals and establish competitive advantage in their sectors. Determination of remuneration, reward, promotion and bonus systems within the business are also elements directly related to employee performance (Rao et al., 2018).

In today's global competitive environment, the rate of change is very high. In such an environment, high innovation performance provides great gains to organizations. In order to keep up with the ever-changing business landscape, innovative companies are more likely to see change, apply new ideas, solve issues in novel ways, take calculated risks, outperform the competition, and generate new possibilities on a regular basis. Through this approach, firms

may enhance their performance, become more dynamic, and create a sustained competitive edge, all while enhancing their innovative skills (Kamya et al., 2011).

3. Research Model and Hypothesis

The hypotheses developed in the study are given as follows:

- H1: Organizational learning has a positive effect on innovation performance.
- H2: Knowledge management has a positive effect on innovation performance.
- H3: For Gender there is a significant difference in the relationship between organizational learning and innovation performance.
- H4: For Gender there is a significant difference in the relationship between Knowledge management and innovation performance.
- H5: For Age there is a significant difference in the relationship between organizational learning and innovation performance.
- H6: For Age there is a significant difference in the relationship between Knowledge management and innovation performance.
- H7: For Education there is a significant difference in the relationship between organizational learning and innovation performance.
- H8: For Education there is a significant difference in the relationship between Knowledge management and innovation performance.

In the light of this information, the model of the study is given in Figure 1.

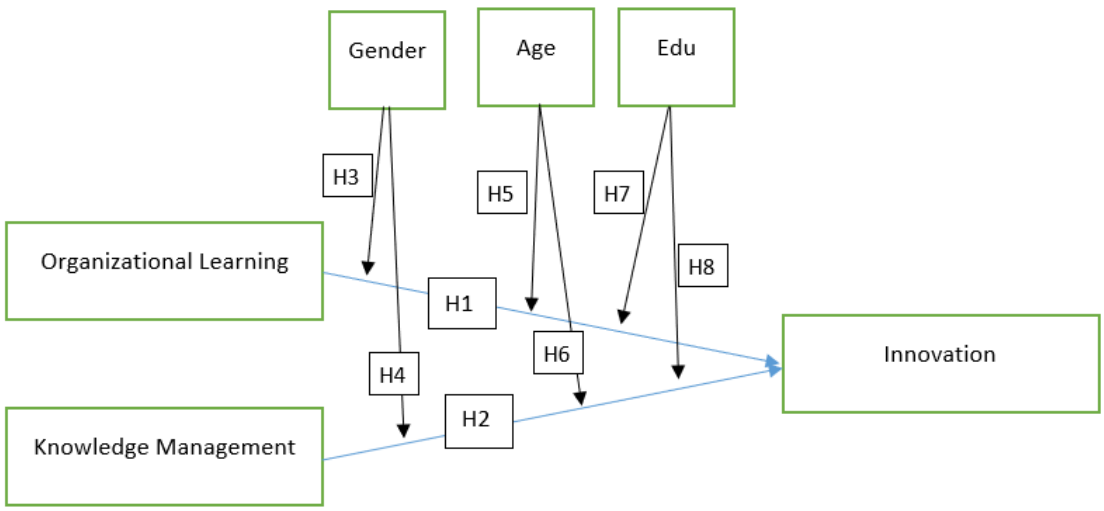


Figure 1: Research Model

4. Research Method

A survey will be conducted for the employees of the companies in the sample selected for the purpose of the study. Employees involved in the study directed to an online survey site through different channels, and survey data collected through the site. Most of the data obtained through e-mail referrals to the site. There is a list of "companies" operating in that region on the web pages of the organized industrial zones. The e-mail addresses in the contact information of those who have access to the websites of the companies in these lists collected.

The questionnaires are constituted of 4 questions as the demographic questions, and the 37 questions with 5-Likert Scale will be used in the questionnaire. It corresponds to (1 = Strongly Disagree, 2 = Disagree, 3 = Undecided, 4 = Agree, 5 = Strongly Agree) on the scale. The Organizational Learning scale developed by Calantone, Cavusgil

and Zhao (2002) consists of 17 statements. The Knowledge Management Scale consists of one dimension and 6 statements. This scale is taken from Choi's (2000). The Innovation scale developed by Hu et al. (2009) with 14 expressions in one dimension.

Appropriate criteria will be specified in the content of the e-mail, those who did not comply will be asked to direct them to the companies that meet the criteria and they are in contact with. In this way, approximately 200 enterprises reached individually. Alternatively, two announcements made to the groups with the relevant companies on Linkedin.

5. Results and Findings

Table 1 clearly shows that the confidence criterion was the percentage values that were defined and expected at the completion of all four tests. Given the high dependability scores, it was inferred that the sample results were consistent and dependable. The results would be reflective of actual values, the applied questionnaire was successful, and the reliability criteria all above 70%. The questionnaire was also found to be self-consistent.

Table 1: Reliability Results of the Survey

Cronbach Alpha	**0.969**
Split	0.965-0.967
Parallel	0.969
Strict	0.967

At this stage of the study, demographic information for the participants asked in the first part of the questionnaire and percentage and descriptive information about the answers to the scale studied were presented.

Table 2: Demographic Variables

(n=370)	**Frequency (F)**	**Percent (%)**
	Gender	
Male	218	58.92
Female	152	41.08
	Age	
26-33 Years	128	34.59
34-41 Years	113	30.54
42 Years and Above	129	34.86
	Education level	
Associate's degree	43	11.62
Undergraduate	278	75.14
Graduate	49	13.24

41.08% of the survey participants are female and 58.92% are male. 34.59% of the people are in the age group of 26-33, 30.54% are in the age group of 34-41 and 34.86% are in the age group of 42 and over. In addition, the average age of the people is 38.24. The education level of 11.62% of the individuals is associate degree, 75.14% of them undergraduate and 13.24% of them postgraduate.

5.1. Explanatory Factor Analysis

By combining p connected variables, factor analysis, a type of multivariate statistics, seeks to identify and uncover a limited number of new, theoretically significant variables (dimensions, factors). The data's eligibility for factor analysis was initially examined as part of the scales' explanatory factor analysis process.

Consequently, the data set's Kaiser-Meyer-Olkin (KMO) sample adequacy was determined to be 0.938, which is higher than the good threshold of 0.70. The results of the Bartlett sphericity test, which assesses the reliability of the items and variables under consideration, were shown to be statistically significant ($\chi 2$= 5138.67 and p=.000). The tests confirmed that the sample size was adequate for the explanatory factor analysis and that the factor analysis method was suitable.

Table 3: Explanatory Factor Analysis Results

	Variance Explained	Cronbach alpha (CA)
Factor 1: Commitment to Learning	15.32	0.932
Factor 2: Shared Vision	14.03	0.934
Factor 3: Open-Minded	13.56	0.920
Factor 4: Information Sharing within the Organization	12.09	0.945
Factor 5: Knowledge Management	9.34	0.934
Factor 6: Innovation	6.21	0.947

In order to uncover the factor structure, the "Varimax" rotation method and the "Principal Components Analysis" method were utilized as factor retention techniques after the tests indicated that the data set was suitable. The factor analysis led to the determination of an 8-component structure, which accounted for 81.56% of the overall variation. For multi-factor designs to be deemed adequate in social science studies, the variance explained must fall between 40% and 60%. Excluding questions with an Extraction column value below 0.20 from the analysis is recommended, as they do not significantly impact the change in variance, as mentioned in the study by Costello and Osborne (2005). Due to the fact that all survey questions were utilized and no question had a significance level < 0.20 for 8 components, no inference was drawn in this study.

5.2. Normality Tests Analysis

In order to decide which methods are appropriate to use in the analyses, normality tests for the dimensions were applied. If normal distribution is provided, parametric methods will be used, otherwise non-parametric methods will be used.

Table 4: Normality test results

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistics	**Std. sapma**	**p**	**Statistics**	**Std. sapma**	**p**
Commitment to Learning dimension	.189	370	.000	.918	370	.000
Shared Vision dimension	.153	370	.000	.929	370	.000
Open-Minded dimension	.212	370	.000	.876	370	.000
Intra-Organizational Information Sharing Dimension	.187	370	.000	.904	370	.000
Information Management dimension	.199	370	.000	.894	370	.000
Innovation dimension	.205	370	.000	.925	370	.000

The result of both normality tests being less than 0.05 allows us to accept the H1 hypothesis that states that the normal distribution is not provided. Here, group difference analysis will make use of non-parametric techniques. Two groups were analyzed using the Mann-Whitney-U test, whereas three or more groups were subjected to the Kruskal Wallis test. To identify the cause of the discrepancy, we looked at the average rank values.

Table 5: Results of Mann-Whitney U test in terms of gender

Dimensions	Group	N	Average rank	Mann-Whitney U	p
Commitment to Learning dimension	Male	218	293.51	40635.5	0.629
	Female	152	286.79		
Shared Vision dimension	Male	218	286.17	40215.5	0.488
	Female	152	295.83		
Open-Minded dimension	Male	218	283.69	39422	0.275
	Female	152	298.88		
Intra-Organizational Information Sharing Dimension	Male	218	288.20	40865.5	0.713
	Female	152	293.33		
Knowledge Management dimension	Male	218	289.15	41169	0.829
	Female	152	292.16		
Innovation dimension	Male	218	293.78	40552	0.600
	Female	152	286.47		

Across all dimensions, there was no discernible gender difference. All dimensions were answered under the same perspective. Considering the average of answers, women and men gave positive (agree) answers to the dimensions. The sub-hypothesis was not provided for any dimension.

Table 6: Kruskal-Wallis test results in terms of age

Dimensions	Group	N	Average rank	Chi-squared value	p
Dimension of Commitment to Learning	26-33 years	128	263.85	**9.352**	**0.009***
	34-41 years	113	**317.38**		
	42 years and older	129	292.76		
Shared Vision dimension	26-33 years	128	284.01	1.307	0.520
	34-41 years	113	302.64		
	42 years and older	129	286.66		
Open-Minded dimension	26-33 years	128	284.44	3.010	0.221
	34-41 years	113	308.96		
	42 years and older	129	281.33		
Intra-Organizational Information Sharing Dimension	26-33 years	128	296.73	0.969	0.615
	34-41 years	113	294.69		

	42 years and older	129	281.76		
Knowledge Management Scale dimension	26-33 years	128	284.33	0.892	0.639
	34-41 years	113	300.33		
	42 years and older	129	288.19		
Innovation dimension	26-33 years	128	277.16	1.824	0.401
	34-41 years	113	298.22		
	42 years and older	129	296.13		

*Significant difference for 0.05

The dimension of commitment to learning shows a significant difference in terms of age. Looking at the mean rank values for the source of the difference, it was determined that the 34-41 age group had the highest value (317,38) and gave more positive answers to the questions of this dimension. Only this dimension is provided for the sub-hypothesis. There was no significant difference for age in the dimensions of shared vision, open-mindedness, information sharing within the organization, knowledge management and innovation. Participants of all ages responded to these dimensions from the same perspective.

Table 7: Kruskal-Wallis test results in terms of education level

Dimensions	Group	N	Average rank	Chi-squared value	p
Dimension of Commitment to Learning	Associate's Degree	43	273,97	1,578	0,454
	Undergraduate	278	290,65		
	Graduate	49	304,00		
Shared Vision dimension	Associate's Degree	43	295,57	0,158	0,923
	Undergraduate	278	288,60		
	Graduate	49	293,09		
Open-Minded dimension	Associate's Degree	43	288,37	1,561	0,458
	Undergraduate	278	285,97		
	Graduate	49	308,70		
Intra-Organizational Information Sharing Dimension	Associate's Degree	43	303,11	1,244	0,536
	Undergraduate	278	291,36		
	Graduate	49	276,70		
Knowledge Management Scale dimension	Associate's Degree	43	265,53	2,599	0,272
	Undergraduate	278	293,21		
	Graduate	49	301,87		
Innovation dimension	Associate's Degree	43	247,14	7,831	**0,019***
	Undergraduate	278	295,20		
	Graduate	**49**	**310,29**		

*Significant difference for 0.05

A significant difference was determined in the innovation dimension in terms of education level. When the average rank values for the source of the difference are examined, the participants with a graduate level of education gave more positive answers to this dimension. Only this dimension is provided for the sub-hypothesis. The level of

education does not show a significant difference in terms of commitment to learning, shared vision, open-mindedness, information sharing within the organization, knowledge management and dimensions. These dimensions were answered under the same point of view.

5.3. Confirmatory Factor Analysis Results and Goodness of Fit

By utilizing a set of observable variables as a measuring instrument, measurement models seek to uncover the extent to which the components, which are latent variables, are explained. Using the AMOS 23.0 program, we first built a first-level CFA model, and then we built a second-level model with latent components and investigated their interdependent effects.

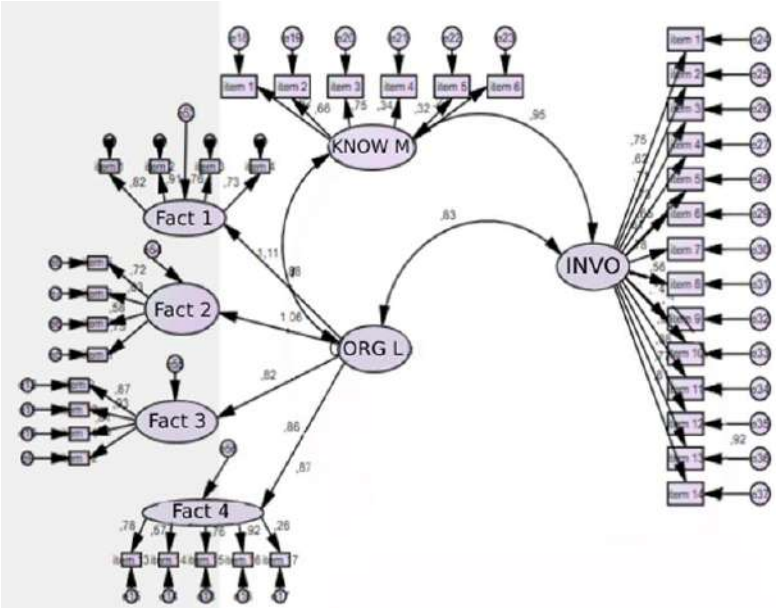


Figure 2: Confirmatory Factor Analysis Result

Table 8 provides the CFA findings; to assess their appropriateness, one must go to Table for the model's fit statistics criteria and outcomes.

Table 8: DFA model Fit Indices

Measurement (Fit Statistics)	Good Fit	Acceptable Fit	Research Model Value	Compliance Status
General Model Fit				
X^2 /sd	≤ 3	≤ 4-5	2.19	Good Fit
Comparative Fit Statistics				
NFI	≥ 0.95	0.94-0.90	0.935	Acceptable
TLI (NNFI)	≥ 0.95	0.94-0.90	0.963	Good Fit
IFI	≥ 0.95	0.94-0.90	0.987	Good Fit
CFI	≥ 0.97	≥ 0.95	0.961	Acceptable
RMSEA	≤ 0.05	0.06-0.08	0.037	Good Fit
Absolute Fit Indices				
GFI	≥ 0.90	0.89-0.85	0.930	Good Fit
AGFI	≥ 0.90	0.89-0.85	0.924	Good Fit
Residual Compliance Index				

RMR	≥ 0.05	0.06-0.08	0.036	Good Fit

It was determined that the model did not require any improvements after reviewing the modification index. It has been determined that the goodness of model fit for the first level is positive. The considered goodness-of-fit criteria have been selected from among the most widely used in the literature. As a result of CFA, mostly good fit was determined for the criteria and acceptable fit was determined for only 2 of them. The factor structure was verified, and the validity of the studied scale was also demonstrated. From this point of view, SEM analysis will be started to test the hypotheses.

5.4. Structural Equation Model (SEM)

Both the structural and measurement models come together to form structural equation models. In order to summarize the relationships between the latent variables, the structural model incorporates structural equations. All of the model's structural equations specify the interactions between structural components.

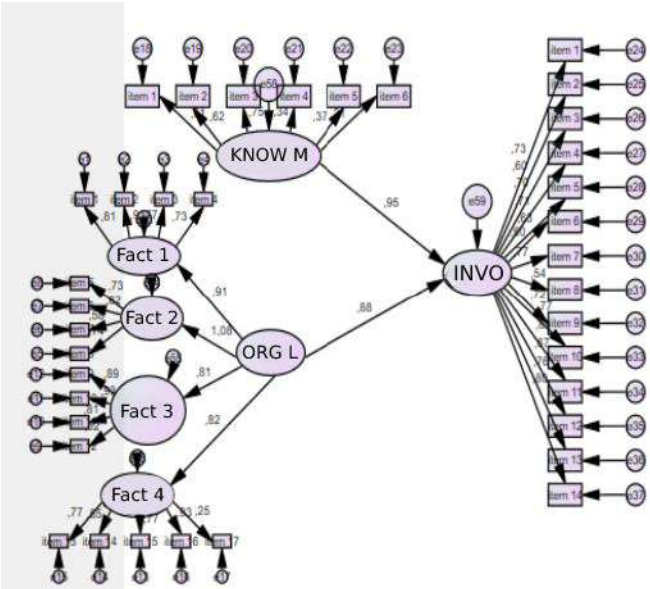


Figure 3: SEM Estimates for Testing Hypotheses

Table 9: SEM estimated Fit Indices

Measurement (Fit Statistics)	Good Fit	Acceptable Fit	Research Model Value	Compliance Status
General Model Fit				
X^2 /sd	≤ 3	≤ 4-5	2.15	Good Fit
Comparative Fit Statistics				
NFI	≥ 0.95	0.94-0.90	0.982	Good Fit
TLI (NNFI)	≥ 0.95	0.94-0.90	0.975	Good Fit
IFI	≥ 0.95	0.94-0.90	0.980	Good Fit
CFI	≥ 0.97	≥ 0.95	0.956	Acceptable
RMSEA	≤ 0.05	0.06-0.08	0.014	Good Fit
Absolute Fit Indices				
GFI	≥ 0.90	0.89-0.85	0.923	Good Fit
AGFI	0.90	0.89-0.85	0.925	Good Fit
Residual Compliance Index				
RMR	≤ 0.05	0.06-0.08	0.026	Good Fit

Although the SEM estimates only met one of the fit criteria, the model met all of the others, indicating a good fit and making it suitable for interpretation. Table displays the outcomes that were obtained using the model.

Table 9: SEM model results for hypothesis testing

Structural Relationship	Direction	Estimated coefficient	Std. Error	t statistic	p	Result
Organizational Learning → Innovation	+	0.949	0.085	11.164	0.000	Significant
Knowledge Management → Innovation	+	0.878	0.064	13.718	0.000	Significant

H1: Organizational learning has a positive effect on innovation.
H2: Knowledge management has a positive effect on innovation.
As can be seen from the model outputs; organizational learning has a 94.9% positive (positive) effect on innovation. Knowledge management has a positive (positive) effect of 87.8% on innovation. H1 and H2, which constitute the main hypothesis of the model, were confirmed.

5. Conclusion

The learning organization climate positively affects the success and gaining an important place in the society in terms of employment, environmental awareness and services offered. It can be said that the foundations of such gains are already formed in an organization where employees are in constant learning and improvement, they constantly question the accuracy of their knowledge and practices, and the shared goals are understood by all employees.

Considering that business managers have a share of innovations in the market and products of the business, it is recommended that they use their management tools for a successful personnel regime to create a service-oriented and highly dynamic organizational environment with goals in this sense. By giving importance to the effect of innovation in creating quality service on the performance of employees, they should see the importance of their role in regulating free competition in the market and encourage innovation in businesses in this sense. With this approach, a balanced competitive environment will be created and innovation will be seen as an important competitive tool for businesses.

Based on the assumption that collective learning awareness in learning organizations and the idea of being open to learning have positive effects on employee performance, it is recommended that candidate employees who are looking for a job prefer organizations where learning has priority in choosing a workplace.

It is recommended that business administrations, which care about increasing service quality and reputation management, adopt an organizational philosophy based on learning, give importance to knowledge management and bring it to their businesses. Learning organizations, which have a management approach that includes critical approaches, actually provide a basis for making quality and accurate decisions with their open information sharing feature within the system. Considering that the learning organization may have some negative effects while gaining positive aspects, this issue should be handled by the top management bodies as it requires sensitive decisions and should be implemented by considering employee performance.

Knowledge management should be kept under control in enterprises. Regular information that protects the social reputation of the enterprise without damaging the learning environment and philosophy should be carried out under the responsibility of business managers. Regular and uninterrupted sharing of information within the business system is of vital importance in many sectors and interacts with organizational performance.

Author Contributions: The following statements should be used "Conceptualization, N.A. and T.A.; Methodology, N.A.; Software, N.A.; Validation, N.A.; Formal Analysis, N.A.; Investigation, N.A.; Resources, N.A.; Data Curation, N.A.; Writing – Original Draft Preparation, N.A.; Writing – Review & Editing, N.A. and T.A.; Visualization, N.A.; Supervision, T.A.; Project Administration, T.A.; Funding Acquisition, N.A."

Funding: This research received no external funding.

Conflicts of Interest: The authors declare no conflict of interest.

Informed Consent Statement/Ethics approval: All participants were fully informed that the anonymity is assured, why the research is being conducted, how their data will be used and if there are any risks associated.

References

Abbas, J., Zhang, Q., Hussain, I., Akram, S., Afaq, A., & Shad, M. A. (2020). Sustainable innovation in small medium enterprises: the impact of knowledge management on organizational innovation through a mediation analysis by using SEM approach. *Sustainability*, *12*(6), 2407.

Abdi, K., Mardani, A., Senin, A. A., Tupėnaitė, L., Naimavičienė, J., Kanapeckienė, L., & Kutut, V. (2018). The effect of knowledge management, organizational culture and organizational learning on innovation in automotive industry.

Antunes, H. D. J. G., & Pinheiro, P. G. (2020). Linking knowledge management, organizational learning and memory. *Journal of Innovation & Knowledge*, *5*(2), 140-149.

Calantone, R. J., Cavusgil, S. T., & Zhao, Y. (2002). Learning orientation, firm innovation capability, and firm performance. *Industrial marketing management*, *31*(6), 515-524.

Choi, B., & Lee, H. (2002). Knowledge management strategy and its link to knowledge creation process. *Expert Systems with applications*, *23*(3), 173-187.

Dasgupta, M., & Gupta, R. K. (2009). Innovation in organizations: A review of the role of organizational learning and knowledge management. *Global Business Review*, *10*(2), 203-224.

Deshpandé, R., Farley, J. U., & Webster Jr, F. E. (1993). Corporate culture, customer orientation, and innovativeness in Japanese firms: a quadrad analysis. *Journal of marketing*, *57*(1), 23-37.

Hu, M. L. M., Horng, J. S., & Sun, Y. H. C. (2009). Hospitality teams: Knowledge sharing and service innovation performance. *Tourism management*, *30*(1), 41-50.

Kamya, M. T., Ntayi, J. M., & Ahiauzu, A. (2011). Organisational learning and competitive advantage: testing for the interacting influence of knowledge management and innovation. *International Journal of Innovation and Learning*, *10*(4), 376-401.

Khan, N. A., & Khan, A. N. (2019). What followers are saying about transformational leaders fostering employee innovation via organisational learning, knowledge sharing and social media use in public organisations?. *Government Information Quarterly*, *36*(4), 101391.

King, W. R. (2009). *Knowledge management and organizational learning* (pp. 3-13). Springer US.

Liao, S. H., & Wu, C. C. (2010). System perspective of knowledge management, organizational learning, and organizational innovation. *Expert systems with Applications*, *37*(2), 1096-1103.

Martin, L. M., & Matlay, H. (2003). Innovative use of the Internet in established small firms: the impact of knowledge management and organisational learning in accessing new opportunities. *Qualitative Market Research: An International Journal*, *6*(1), 18-26.

Nawab, S., Nazir, T., Zahid, M. M., & Fawad, S. M. (2015). Knowledge management, innovation and organizational performance. *International Journal of Knowledge Engineering*, *1*(1), 43-48.

Noruzy, A., Dalfard, V. M., Azhdari, B., Nazari-Shirkouhi, S., & Rezazadeh, A. (2013). Relations between transformational leadership, organizational learning, knowledge management, organizational innovation, and organizational performance: an empirical investigation of manufacturing firms. *The International Journal of Advanced Manufacturing Technology*, *64*, 1073-1085.

Nouri, B. A., Ghorbani, R., & Soltani, M. (2017). The effect of knowledge management on organizational innovation with the mediating role of organizational learning (case study: Agricultural Bank in Iran). *Journal of Applied Economics and Business Research JAEBR*, *7*(3), 194-211.

Pérez López, S., Manuel Montes Peón, J., & José Vázquez Ordás, C. (2004). Managing knowledge: the link between culture and organizational learning. *Journal of knowledge management*, *8*(6), 93-104.

Rao, Y., Yang, M., & Yang, Y. (2018). Knowledge sharing, organizational learning and service innovation in tourism. *Journal of Service Science and Management*, *11*(5), 510-526.

Sanz-Valle, R., Naranjo-Valencia, J. C., Jiménez-Jiménez, D., & Perez-Caballero, L. (2011). Linking organizational learning with technical innovation and organizational culture. *Journal of knowledge management*, *15*(6), 997-1015.

Schneckenberg, D., Truong, Y., & Mazloomi, H. (2015). Microfoundations of innovative capabilities: The leverage of collaborative technologies on organizational learning and knowledge management in a multinational corporation. *Technological Forecasting and Social Change*, *100*, 356-368.

Stata, R. (1989). Organizational learning-the key to management innovation. *MIT Sloan Management Review*, *30*(3), 63.

Uddin, M. A., Fan, L., & Das, A. K. (2016). A study of the impact of transformational leadership, organizational learning, and knowledge management on organizational innovation. *Management dynamics*, *16*(2), 42-54.

Walker, D. H. (2016). Reflecting on 10 years of focus on innovation, organisational learning and knowledge management literature in a construction project management context. *Construction innovation*, *16*(2), 114-126.

Yu, C. P., Zhang, Z. G., & Shen, H. (2017). The effect of organizational learning and knowledge management innovation on SMEs' technological capability. *Eurasia Journal of Mathematics, Science and Technology Education*, *13*(8), 5475-5487.

The Asian Institute of Research
Economics and Business Quarterly Reviews
Vol.7, No.1, 2024: 127-139
ISSN 2775-9237

DOI: 10.31014/aior.1992.07.01.564

The Nexus of Economic and Sociodemographic with Smoking in Indonesia

Wilson Rajagukguk[1], Adolf B. Heatubun[2], Medyawanti Pane[3], Omas Bulan Samosir[4], Perak Samosir[5]

[1] Faculty of Economics and Business dan Postgraduate Program Universitas Kristen Indonesia. Email: wrajagukguk@yahoo.com & wilson.rajagukguk@uki.ac.id
[2] Postgraduate Program Universitas Kristen Indonesia. Email: adolf.heatubun@uki.ac.id
[3] Faculty of Engineering, Universitas Kristen Indonesia. Email: medyawanti.pane@uki.ac.id
[4] Department of Economics, Faculty of Economics and Business, Universitas Indonesia. Email: omas.bulan@ui.ad.ic
[5] Study Programme of Mechanical Engineering, Institut Teknologi Indonesia, Tangerang Selatan, Banten, Indonesia. Email: samosirperak@gmail.com

Correspondence: Dr. Wilson Rajagukguk, Faculty of Economics and Business, Universitas Kristen Indonesia, Jl. Mayjen Sutoyo No. 2, Jakarta Timur, Indonesia. E-mail: wrajagukguk@yahoo.com

Abstract
Tobacco kills half of its users if they don't stop. Cigarettes kill more than 8 million people every year, including an estimated 1.3 million passive smokers who are exposed to active smokers. Smoking behavior is truly an action that has a negative impact on smokers themselves and their entire community. About one in seven deaths worldwide are caused by smoking. This research was conducted by analyzing the results of the National Socioeconomic Survey (*Survei Sosial Ekonomi Nasional*/SUSENAS). SUSENAS 2021 was carried out by the Statistics Indonesia (Central Statistics Agency/BPS) in March 2021. It covered all provinces in Indonesia. It was done to meet the need of social and economic development data at district, province, and national level, including data on sustainable development goals. The unit analysis of this study was population aged 15 years and above who smoke nicotine cigarettes. The unweighted number of the respondents in the study was 1888. The dependent variable was whether the smoke nicotine cigarette or not. The independent variables were gender, age, marital status, education, place of residence, island of dwelling, and working status. The in this study were analyzed using univariate, bivariate, and multivariate analyses to assess, respectively, the sample characteristics, percentage distribution of those who reported crimes by demographic and socioeconomic factors, and demographic and socioeconomic causes of crime reporting. A binary logistic regression was used to investigate demographic and socioeconomic factors of crime reporting. The probability of smoking was higher among those who were males, were aged 30-54 years, had no schooling/incomplete primary school and complete primary school, lived in urban areas, dwelled in Bali and Nusa Tenggara Island, and were not working

Keywords: Socioeconomic Determinants, Sociodemographic, Smoking, Indonesia

1. Background

Tobacco kills half of users if they don't quit (Doll et al., 2004, Bank et al., 2015, Siddiqi et al., 2020). Cigarettes kill more than 8 million people every year (Roser, 2021), including an estimated 1.3 million people who are passive smokers who are exposed to active smokers (Global Burden of Disease Database, 2019). Smoking behavior has a negative impact on smokers themselves and their entire community. About one in seven deaths worldwide is caused by smoking (Roser, 2021). Millions of people live in poor health because of smoking. Smoking is the leading cause of early death through heart disease and cancer. Smoking is a risk factor (Allender et al., 2009) for chronic complications, including cancer, cardiovascular disease, and premature death (Ekpu & Brown, 2015). It is estimated that around 100 people died prematurely from smoking, mostly in rich countries in the 20th century (Richie & Roser, 2023). The health impacts of smoking and tobacco use are enormous. Smoking and using tobacco results in communicable diseases such as tuberculosis and other respiratory diseases (Heriyani et al., 2013; Liew & Hsu, 2009) and non-communicable diseases such as diabetes (Soewondo & Pramono, 2011), cardiovascular disease, cancer.

Smokers' income is significantly lower than nonsmokers (Darlen et al., 2020). Smokers tend to have more health issues and disabilities and are less productive than non-smokers (CDC Tobacco Free, 2019). Smokers are more absent from work and have an impact on being less productive. Office policies allowing time for smoking breaks can also reduce productivity—if the workplace has a ban on smoking indoors, a smoker will need to break work hours to go outside for a smoke break. Additionally, the additional health care costs experienced by smokers can ultimately be detrimental to employers due to the higher costs of providing health insurance to their workers. Globally, more than one in five cancer deaths is related to smoking behavior. This means that tobacco kills more people every day than terrorist deaths do in one year. Smoking has a more immediate impact on wages for women than for comparable men. This is consistent with research conducted by others showing that obesity has a greater impact on women's wages compared to comparable men's wages. (Cawley, 2013; Gilleskie et al., 2017; Mason, 2012).

Other than premature death, the most detrimental aspect of smoking is the loss of productivity due to premature death. It is estimated that economic losses due to lost productivity amount to US$ 151 million as a result of premature deaths of smokers, who have an average life expectancy 10 years lower than non-smokers (Centers for Disease Control and Prevention, 2014).

Tobacco smoking is one of the world's biggest health problems. Smoking, both active and passive, harms and damages human health and is associated with economic costs. Smoking cigarettes is a cause of preventable disease, causes premature death, and is the cause of a number of health problems. The World Health Organization (WHO) estimates that every year there is an economic loss of half a trillion US Dollars (Gonzales, 2015). Costs due to smoking can be classified into direct, indirect and intangible costs. About 15% of total health care expenditure in high-income countries is attributable to smoking. In the USA, the proportion of health care expenditures attributable to smoking ranges between 6% and 18% in various states. In England, the direct costs of smoking to the NHS are estimated to be between £2.7 billion and £5.2 billion, which equates to around 5% of the total NHS budget each year. Estimates of the economic burden of smoking on GDP show that smoking accounts for about 0.7% of China's GDP and about 1% of US GDP. As part of the indirect (non-health related) costs of smoking, the total productivity loss caused by smoking each year in the US is estimated at US$151 billion (Ekpu & Brown, 2015).

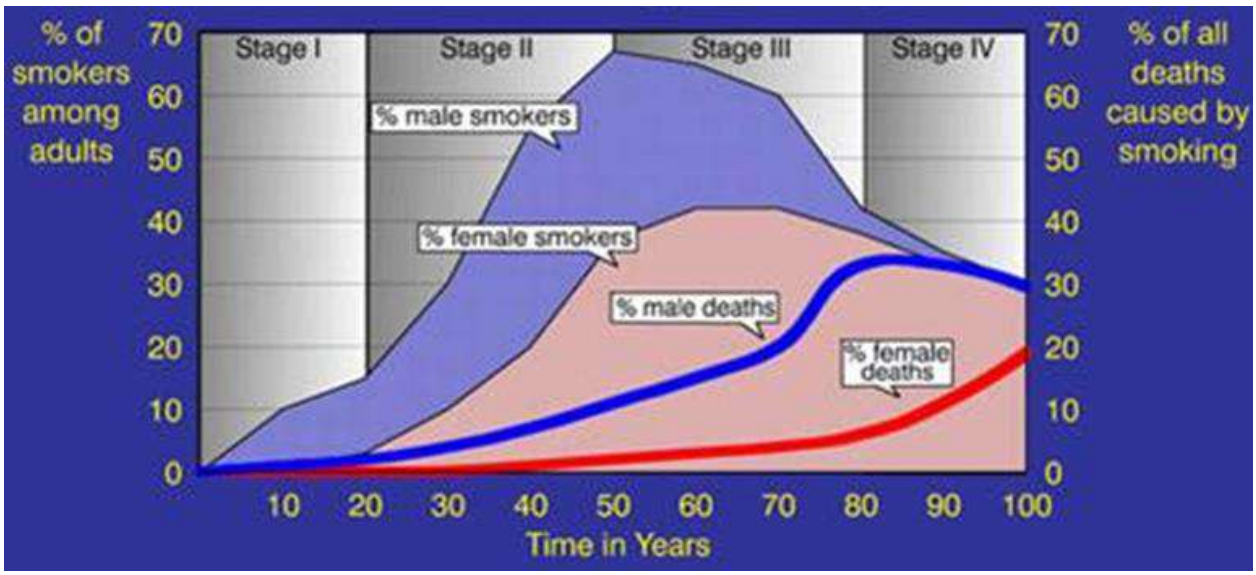


Figure 1: A Model of The Cigarette Epidemic

Source: Lopez et al (1994) and Greenhalgh et al (2023)

A paradigm that describes the general development of tobacco use throughout the world, first proposed by Lopez et al. (1994) is shown in Figure 1. It seems that the experience of tobacco use patterns in Indonesia fits this model. Stage I of this model is characterized by low smoking prevalence (below 20%), generally limited to men and accompanied by a slight increase in tobacco-related chronic diseases. Countries in phase I are not yet the main consumers of the global tobacco economy, but represent untapped potential of the tobacco industry. In the phase II paradigm, smoking prevalence in men increases to more than 50%, and smoking rates in women also begin to increase. Cigarette uptake occurs at an early age, and although there is evidence of an increase in lung cancer and other chronic diseases due to smoking among men, public and political understanding of and support for tobacco control initiatives is still not widespread. Countries entering this transition stage include Japan, several countries in Southeast Asia. Phase III of the epidemic has been reached when the prevalence of smoking reaches its peak and begins to decline in both sexes, although smoking-related deaths continue to increase due to the high rates of smoking in the past. Health education programs were better developed, and smoking became less accepted among more educated groups. Smoking is becoming less socially acceptable and the climate is becoming more conducive to the implementation of tobacco control policies. The evolution to stage IV is characterized by a continuous but gradual decline in smoking prevalence, in both men and women. Men's deaths from smoking are starting to decline, but women's death rates continue to rise, reflecting past smoking patterns.

The total number of cigarettes reported sold in the US or given away by major manufacturers in 2021, was 190.2 billion cigarettes, representing a decrease of 13.5 billion cigarettes (6.7 percent) compared to 2020. Advertising and promotion spending increased from 2020 to 2021, up from $7.84 billion to $8.06 billion. The largest spending category in 2021 was price discounts paid to cigarette retailers to lower cigarette prices to consumers, which amounted to $6.01 billion (74.6 percent of total advertising and promotion spending). (Federal Trade Commission, 2023). Economically, in 2020, the USA lost US $436.7 million as a result of smoking (The Lancet, 2022). 1.7% of GDP loss of personal income and 0.4% of GDP loss of household productivity.

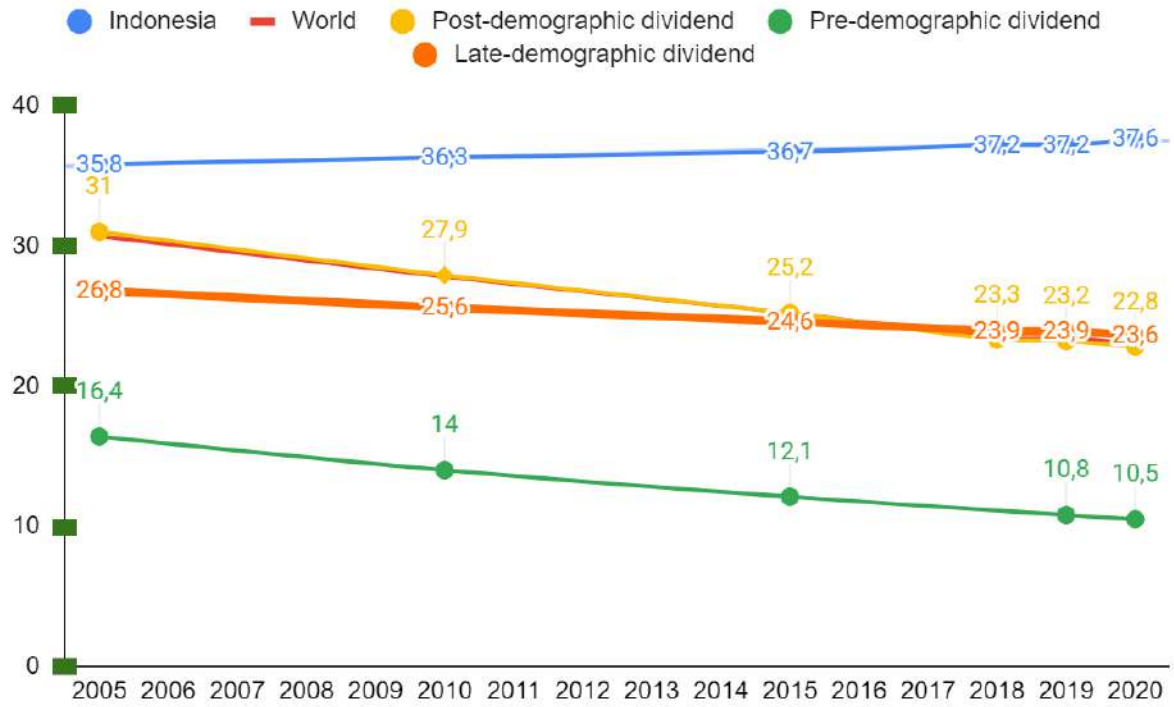


Figure 2: Prevalence of current tobacco use (% of adults), Indonesia, World, and Demographic Dividend Countries, 2005- 2020.

Source: Global Burden of Disease (2023). Author calculation.

In Figure 2, the prevalence of the adult population who smoke from 2005 - 2020 is presented. It can be seen that the trend of world smoking prevalence, and country groups based on demographic dividend, tends to decrease. However, in Indonesia the opposite happened, that the smoking trend actually increased in the period 2005 – 2020. The prevalence of smokers in Indonesia was 35.8% of the adult population in 2005 and this figure continued to increase to 37.6% in 2020. In 2019, the prevalence of ever smoking among the adult male population in Indonesia reached 64.5% (Meilissa, et al., 2022). Meilissa et al. (2022) also reported that the prevalence of smoking in the population aged 10-18 increased from 7.2% in 2013, to 9.8% in 2018. It was 51.3% of the entire adult population and 66.2% of the young population aged 13-15 years. regularly exposed to passive smoking.

The Ministry of Health (2022) using the results of a survey conducted by the Global Adult Tobacco Survey - GATS, - reported that in Indonesia during 2012-2021 there was an increase in the number of adult smokers from 60.3 million people in 2011 to 69.1 million people in 2021. The prevalence of e-smokers increased 10-fold from 0.3% (2011) to 3% (2021). Spending on cigarettes in Indonesia reaches Rp. 64 trillion in 2021. The prevalence of passive smoking is 120 million people in 2021. Exposure to cigarette smoke is high in public places such as restaurants, households, government buildings, workplaces, public transportation and health facilities. Even though there has been a significant decrease in attention to cigarette advertising, promotions or sponsorship, there has been an increase in exposure to cigarette advertising on the internet from 1.9% in 2011 to 21.4% in 2021 (an increase of more than 10 times). Jayani (2022) and Sari (2023) found that in Indonesia the poorer the people, the higher their consumption[1]. Male cigarette consumption was highest in the lowest quintile (82%), followed by the middle quintile (73.3%), upper middle quintile (70.2%), and upper quintile (58.2%). Cigarettes are the main consumption of poor people in Indonesia. Cigarettes contribute to poverty by 11.38% in rural areas and 12.22% in urban areas (Sari 2023). Poor households spend an average of Rp. 286,000 per month. This figure is higher than buying nutritious food for children. Children of chronic smoking parents have a lower body weight of 1.5 kg

[1] Consumption of poor people in Indonesia from the largest to small percentages: tobacco/cigarettes, purebred chicken eggs, purebred chicken meat, granulated sugar, instant noodles, shallots, ground coffee and instant coffee, cobs, bread, cayenne pepper and wet cakes

compared to children of non-smoking parents (Jayani, 2022). Meilissa et al. (2022) also found that economic losses due to smoking in 2019 ranged from IDR 184.36 trillion to IDR 410.76 trillion (1.16%–2.59% of gross domestic product). The National Medium-Term Development Plan 2020–2024 (Bappenas, 2015) states that smoking is one of the threats to the national development plan.

2. Literature Review

Several studies present the determinants of smoking and cigarette consumption (Avey, 2011,; Carvajal et al., 2000; Garret et al., 2019; Kendler et al., 1999; Simons-Morton, 2002; Wang and Wu 2020; Wood et al., 2019).

Wood et al. (2019) proposed a chart of smoking determinants presented in Figure 3. The key characteristics that influence adult smokers are a combination of age, ever smoking or drinking; and parental, sibling and peer smoking. An increased risk of smoking is associated with increasing age, lower socioeconomic status, poor academic performance, a rebellious or sensation-seeking nature, intention to smoke in the future, a tendency to promote tobacco, having family or friends who smoke, and exposure to cigarettes. in the film. Factors that play a protective role in the emergence of smoking habits are higher self-esteem and high levels of parental supervision.

Other factors are thought to have a greater or lesser influence on behavior at different stages in a person's life: the determinants of smoking in early adolescence may differ from the factors that are important in middle to late or early adolescence adulthood. Determinants of smoking may vary depending on the stage of smoking initiation, for example the development of an intention to smoke versus nicotine dependence. There are certain determinants that influence smoking behavior among adolescents at the smoking stages (such as never smoking, experimental smokers, and regular smokers), hanging out with friends who smoke. Low levels of exposure to school were found to have a greater influence on the early stages of smoking. Alcohol use was found to have an influence on the early stages of smoking prevalence. Other predictors that influence smoking behavior include depression, delinquency, parental smoking habits, and connectedness to family.

For teenagers aged 14 years, several psychological factors were found, such as rebellious attitudes and sensation seeking. Temperament, family experiences and interactions with the wider environment all influence adolescents in developing individual characteristics that make them more vulnerable to drug use and dependence.

Research in Australia (Wood et al., 2019) tested predictors of changes in adolescent smoking behavior in three analytical models based on data from students in Grades 7–10 conducted with analysis over 12 months.18. it was found that in men, the frequency of risk-taking behavior and the level of friendship with male smokers were strong predictors of behavior change to becoming a smoker. Meanwhile, for women, the main predictor is whether at least one of their parents is a smoker.

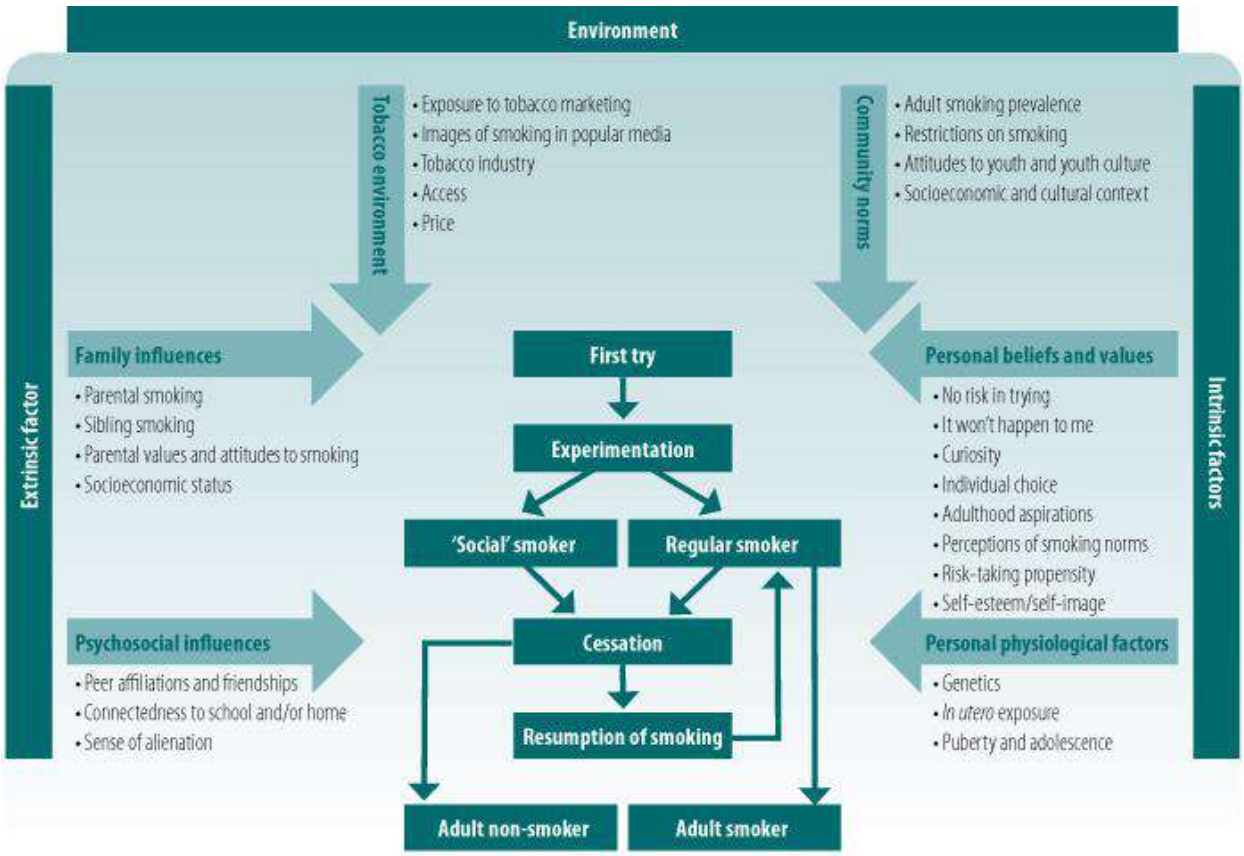


Figure 3: Determinants of smoking

Source: Wood et al. (2019)

Meanwhile, the results of a study in Canada (Wood et al., 2019) found that the main factors that trigger the start of smoking are poor academic performance, stress and alcohol use. Smoking by parents, siblings, and especially friends, as well as susceptibility to tobacco advertising are higher risk factors for initiating and continuing to smoke. Research also shows that pleasurable experiences during early smoking trials are an important factor in the transition to smoking. potentially play a greater role in smoking behavior

Avey (2011) lists a number of smoking backgrounds as social, economic and psychological, namely low education, low income, working class job (Barbeau et al., 2000). Those with low self-confidence and low optimism appear to be the groups most at risk for increasing smoking habits. Attitudes, peer norms, parental norms, perceived behavioral control, and perceived prevalence were consistent predictors of all smoking status outcomes. (Carvajal et al., 2000). Smoking was also positively associated with lower levels of education, extroversion, mastery, and self-esteem, higher levels of neuroticism and dependency, and a history of mood disorders and alcohol use. (Kendler et al. 1999), problems in interacting with peers, and depression (Simons-Morton, 2002).

Wang G. and Wu L. (2020), proposed social determinants of cigarette smoking and ever using electronic cigarettes (e-cigarettes). There are differences in smoking between demographic and socioeconomic backgrounds. Non-Hispanic white male youth are more likely to become smokers as they grow older. Younger residents with lower levels of education, living below the poverty line, and having poor physical health status have a higher prevalence of smoking. Past e-cigarette use is more likely to be associated with subsequent cigarette use among younger generations.

Low socioeconomic status interacts with a variety of other factors to influence smoking behavior, including race/ethnicity, cultural characteristics, social marginalization (e.g., lesbian, gay, bisexual, and transgender communities, people with mental illness and substance use disorders), stress, and lack of empowerment. public. Another factor that has a big impact is the social determinants of health. Income is a determinant of tobacco smoking. Macroeconomic factors also have an influence, such as the distribution of resources, inequality in social

services which can result in disparities that have an impact on tobacco consumption in the USA. (Brady, 2020). Arrazola et al., (2023) found that smoking prevalence is also determined by race and ethnicity. Garrett et al. (2019) found that lower socioeconomic status was associated with increased smoking across age, race/ethnicity, region regardless of gender.

A study conducted by Sreeramareddy et al., (2015) in Eastern Europe showed that the prevalence of smoking in men was 40% higher than the prevalence of smoking in women. Smoking in men is associated with higher age, lower education, and poverty. Meanwhile, among women, the prevalence of smoking is higher among those with higher education and who are more prosperous/wealthier. Smoking in men and women is associated with unskilled workers, living in urban areas and being single. Garrett et al., (2019) found that the determinants of smoking are education, wealth/economic status in the USA. Overall, for both men and women, there was a significant inverse association between current smoking and education. smoking prevalence was higher in groups with lower levels of education. The current smoking prevalence is 31.6% in residents who do not have a high school diploma, 27.5% in residents who have a high school diploma, 25.1% in residents who have tertiary education but do not have a bachelor's degree, and 10 .8% of the population has a bachelor's degree.

Examining differences in sociodemographic background by age, race/ethnicity, and US region, education remains a determinant of smoking. Based on age group, the highest number of smokers is in the youngest age group (25-44 years) with a high school diploma for both men and women. The prevalence of smoking was higher among white and black men with and without a high school diploma than among Hispanic adult men with similar levels of education. The prevalence of smoking was higher among white and black adult women with or without a high school diploma than among Asian and Hispanic adult women with similar education. The lowest smoking prevalence occurs in men and women living in the West, including those with low levels of education.

Overall smoking prevalence was 41.1% among men with incomes below the federal poverty level and 23.7% among men with incomes at or above the poverty level. Smoking prevalence was 32.5% among women with incomes below the federal poverty level and 18.3% among those with incomes at or above the poverty level. Both men and women with incomes below the federal poverty level had a significantly higher smoking prevalence than those living at or above the poverty level, with the exception of Asian women and Hispanic men. High smoking prevalence was found in certain groups of men and women with incomes below the federal poverty level: white men (50.9%), white women (44.8%), black men (44.1%), black men (44.1%), American Indian/Alaskan native (53.7%), and American Indian/Alaska Native women (49.0%).

Even though the global prevalence of smoking has decreased (from 22.7% in 2007 to 17% in 2021) (Figure 3), the percentage of smokers still remains high. Globally, at least 940 million men and 193 million women aged 15 years and over were active smokers in 2019. More than 75% of male daily smokers live in countries with a medium or high human development index (HDI), while more 53% of female daily smokers live in countries with very high HDI (Figure 3). Three-quarters of male daily smokers currently live in countries with moderate or high HDI, while more than half of female daily smokers live in countries with very high HDI. The prevalence of smoking between genders is higher in the group of countries with a higher HDI. The prevalence of smoking in the low HDI country group is 4.2% for men and 3.3% for women. The prevalence of male smoking was 20.90% at Medium HDI and 54.90% at High HDI and decreased to 19.90% at high HDI. The prevalence of smoking in women has increased significantly according to the HDI. As many as 13.50% of women smoke in Medium HDI countries, 29.90% in High HDI, and this increases sharply to 53.3% in very high HDI.

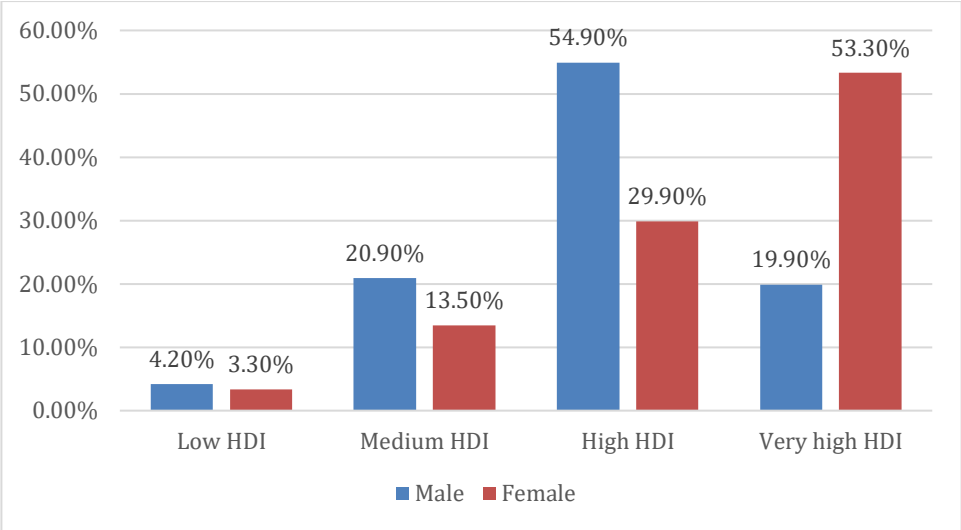


Figure 4: Distribution of smokers by sex (age 15+ years), by country HDI 2019

Source: GBD, 2019. Author calculation

Figure 4 presents the 10 countries with the highest number of smokers in the world (2019). The countries with the highest number of smokers in the world are China, India, Indonesia, USA, Russian Federation, Bangladesh, Japan, Turkey, Viet Nam and the Philippines. In the ten countries, there are significant differences in the incidence of smoking between men and women. As many as 318.1 million men and 23.2 million women smoked in China in 2019. In the same year as many as 58 million men and 3.5 million women smoked in Indonesia. From this data it can be seen that gender is a background determinant of smoking.

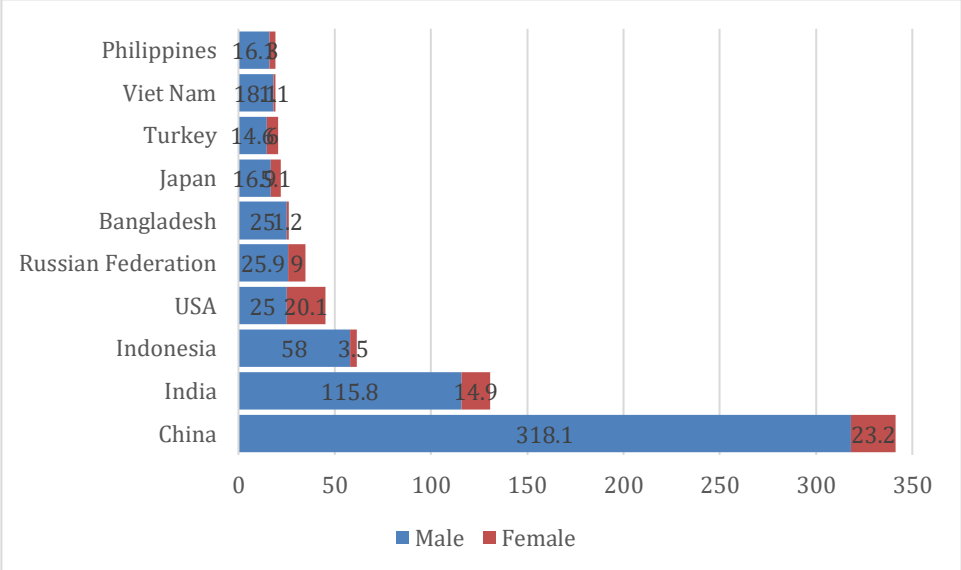


Figure 5: Countries with the highest number of smokers (age 15+ yrs) (millions), 2019

Source: GBD, 2019. Author calculation

3. Data and Analysis Methods

This research was conducted by analyzing the results of the National Socioeconomic Survey (*Survei Sosial Ekonomi Nasional*/SUSENAS) in 2021. SUSENAS 2021 was carried out by the Statistics Indonesia (Central Statistics Agency/BPS) in March 2021. It covered all provinces in Indonesia. It was done to meet the need for social and economic development data at district, provincial, and national levels, including data on sustainable development goals.

The unit analysis of this study was population aged 15 years and above who smoke nicotine cigarette. The unweighted number of the respondents in the study was 1888. The dependent variable was whether the smoke nicotine cigarette or not. The independent variables were gender, age, marital status, education, place of residence, island of dwelling, and working status.

The in this study were analyzed using univariate, bivariate, and multivariate analyses to assess, respectively, the sample characteristics, percentage distribution of those who reported crimes by demographic and socioeconomic factors, and demographic and socioeconomic causes of crime reporting. A binary logistic regression was used to investigate demographic and socioeconomic factors of crime reporting. The model was as follows.

$$n\left(\frac{p}{1-p}\right) = \beta_0 + \beta_1 GENDER + \beta_2 AGE + \beta_3 MARITAL + \beta_4 EDUCATION + \beta_5 URBAN + \beta_6 ISLAND + \beta_7 WORK + \varepsilon$$

p is the probability of reporting crime to the police. β_0 is the model intercept. β_k is the regression coefficient of the k-th independent variable k, k = 1, 2, …, 7. ε is the error term.

Diagnostic test of multi-collinearity was dome using correlation coefficient. In addition, to measure the overall goodness-of-fit test, Hosmer and Lemeshow test and chi-square ($\chi 2$) test were also done. Further, scalar measure of goodness of fit test of the was carried out employing the Nagelkerke determination coefficient (R^2).

4. Results and Discussion

The results of univariate, bivariate and multivariate analyzes are presented in Tables 1, 2 and 3. From Table 1 it can be seen that 61.6% of respondents do not smoke. The largest percentage of respondents were women (64.5%), aged 30-54 years (57%), married (81%), had a complete senior secondary school education (38.4%), lived in rural areas (61.7%), live on the island of Java (29.8%), and work (73.8%).

Table 1: Percentage distribution of smoking by background characteristics, SUSENAS 2021.

Background characteristics		**Number of observation**	**Percentage**
Number of smoking			
	No	1163	61.6
	Smoking	725	38.4
Gender			
	Male	1218	64.5
	Female	670	35.5
Age (years)			
	15-29	510	27.0
	30-54	1076	57.0
	55+	302	16.0
Marital status			
	Not yet married	359	19.0
	Married	1529	81.0
Education			
	No schooling/incomplete primary school and complete primary school	500	26.5
	Complete junior secondary school	345	18.3
	Complete senior secondary school	723	38.4
	Complete university	320	16.9
Place of residence			
	Urban	724	38.3
	Rural	1164	61.7
Island of residence			
	Sumatera	556	29.4
	Java	563	29.8
	Bali and Nusa Tenggara	112	5.9

	Kalimantan	161	8.5
	Sulawesi	287	15.2
	Maluku and Papua	209	11.1
Working status			
	Working	1393	73.8
	Not working	495	26.2
Total		1888	100

Source: SUSENAS 2021 (Author' compilation).

From Table 2 we can see the bivariate analysis of respondents. The highest percentage smoked according to background characteristics. Percentage of smoking men (61.6%), women (98%), aged 15-29 years (25.3%), aged 30-54 years 45.8%, aged 55+ years 34.1%, not married (22.0%), married (41.4%), No schooling/incomplete primary school and Complete primary school (45.4%), Complete junior secondary school (39.1%), Complete senior secondary school (39.4%), Complete university (24.4%). Urban (34.5%), Rural (44.8%), Sumatra (39.4%), Java (40%), Bali and Nusa Tenggara (48.2%), Kalimantan (32.3%), Sulawesi (32.8%), Maluku and Papua (38.4%)

Table 2: Percentage distribution of number of smoking status by background characteristics, SUSENAS 2021

Background characteristics		**Number of smoking**		**Total (%)**
		Yes	**No**	
Gender				
	Male	61.6	38.4	100.0
	Female	98.1	1.0	100.0
Age (years)				
	15-29	25.3	74.7	100.0
	30-54	45.8	54.2	100.0
	55+	34.1	65.9	100.0
Marital status				
	Not yet married	22.0	78.0	100.0
	Married	41.4	58.6	100.0
Education				
	No schooling/incomplete primary school and Complete primary school	45.4	54.6	100.0
	Complete junior secondary school	39.1	60.9	100.0
	Complete senior secondary school	39.4	60.6	100.0
	Complete university	24.4	75.6	100.0
Place of residence				
	Urban	34.5	65.5	100.0
	Rural	44.8	55.2	100.0
Island of residence				
	Sumatera	39.4	60.6	100.0
	Java	40.0	40.0	100.0
	Bali and Nusa Tenggara	48.2	51.8	100.0
	Kalimantan	32.3	67.7	
	Sulawesi	32.8	67.2	100.0
	Maluku and Papua	38.4	61.6	100.0
Working status				
	Working	53.8	46.2	100.0
	Not working	83.4	16.6	100.0
Total		38,4	61,6	100.0

Source: SUSENAS 2021 (Author' compilation)

Table 4: Odds ratio of the binary logistic regression of the determinants of smoking, SUSENAS 2021

Covariates		**Odds ratio [95% CI]**	***p*-value**
Gender (ref: Male)			
	Female	0.014 [0.008-0.025]	< 0.001
Age (years) (ref: 55+)			
	15-29	1.149 [0.725–1.820]	> 0.001

	30-54	1.682 [1.218–2.323]	< 0.005
Marital status (ref: Married)			
	Not yet married	0.659 [0.425–1.021]	>0.005
Education (ref: Complete University)			
	No schooling/incomplete primary school and complete primary school	3.964 [2.709-5.800	< 0.001
	Complete junior secondary school	3.614 [2.379-5.490]	< 0.001
	Complete senior secondary school	2.851 [2.018–4.028]	< 0.001
Place of residence (ref: Rural)			
	Urban	1.296 [1.006–1.669]	< 0.001
Island of residence (ref: Maluku and Papua)			
	Sumatera	1.121 [0.749–1.680]	> 0.001
	Java	1.386 [0.920–2.089]	>0.001
	Bali and Nusa Tenggara	2.138[1.148–3.981]	> 0.001
	Kalimantan	0.630 [0.402–0.987]	> 0.001
	Sulawesi	0.911 [0.400–0.810]	> 0.001
Working status (ref: Not working)			
	Working	0.569 [0.974–1.005]	0.002
Constant		0.328	< 0.001

Source: SUSENAS 2021 (Author' compilation)

The results of multivariate analysis were presented in Table 3. It can be seen that statistically, significant demographic and socioeconomic causes of crime reporting in Indonesia were gender, age, marital tatus, education, place of residence, island of dwelling, and working status.

The results of the multivariate analysis show that higher probability of smoking was associated with being male, being aged 30-54 years, married, having no schooling/incomplete primary school and complete primary school, living in urban areas, dwelling in Bali and Nusa Tenggara Timur, and being not working. Other things being the same, (i) females were 0.014 times more likely to smoke than males, (ii) those who were aged 30-54 years were 1.682 times more likely to smoke than those who were aged 55 + years, (iii) those who No schooling/incomplete primary school and complete primary school were 2.964 times tend to smoke than those who complete universities, (iv) those who lived in urban areas were 1.296 time times more likely to smoke than those who lived in rural areas, (v) those who dwelled in Bali and Nusa Tenggara was 2.138 times more likely to smoke than those who dwelled in Maluku and Papua, and (vi) those who were working 0.269 times less likely to smoke than those who were working. The findings from this study support the results of previous studies on the importance of demographic and socioeconomic on the probability of reporting crime to the police.

5. Conclusion

The results of this study show that 61.6 % of population aged 15 years and above did not smoke. The percentage of those who reported smoke was higher among males, age between 30 – 54 years, married, complete senior secondary school, live in urban, dwelled in Java, and working.

After controlling for other factors, the probability of smoking was higher among those who were males, were aged 30-54 years, had no schooling/incomplete primary school and complete primary school, lived in urban areas, dwelled in Bali and Nusa Tenggara Island, and were not working. The results of this study imply the need to improve the information, education, and communication about the danger of smoking particular among those all population.

Author Contributions: All authors contributed to this research.

Funding: Not applicable.

Conflict of Interest: The authors declare no conflict of interest.

Informed Consent Statement/Ethics Approval: Not applicable.

References

Allender S, Balakrishnan R, & Scarborough P, et al. (2009). The burden of smoking-related ill health in the United Kingdom. *Tob Control*; 18:262–267.

Arrazola R.A., Griffin, T., Lunsford N.B., Kittner, D., Bammeke, P., Courtney-Long, E. A., et al. (2023), US Cigarette Smoking Disparities by Race and Ethnicity — Keep Going and Going!. *Prev Chronic* Dis; 20:220375. DOI: http://dx.doi.org/10.5888/pcd20.220375

Avey, H. (2011). Health in All Policies Approach to Tobacco Prevention and Control, PPt, Georgia Health Policy Center, Georgia State University.

Banks, E., Joshy, G., & Weber, M.F. *et al.* (2015). Tobacco smoking and all-cause mortality in a large Australian cohort study: findings from a mature epidemic with current low smoking prevalence. *BMC Med* 13, 38 (2015).

Bappenas. (2015). National Medium Term Development Plan (Rencana Pembangunan Jangka Menengah, Masional (RPJMN) 2015–2019. Jakarta.

Barebou, E.M., Krieger, N., & Soobader M.J. (2004). Working Class Matters: Socioeconomi Disadvantae, Race, etnicity, Gender, and Smoking in NHIS 2000. *American Journal of Public Health*, 94(2); 269-278. https://doi.org/10.2105/AJPH.94.2.269

Brady, K.T. (2020). Social Determinants of Health and Smoking Cessation: A Challenge. *The American Journal of Psychiatry*.https://doi.org/10.1176/appi.ajp.2020.20091374

Carvajal, S.C., Wiatrek, D.E., Evans, R.I., Knee, C.R., & Nash, S.G. (2000). Psychological Determinants of the Onset and Escalation of Smoing: Cross-Sectional and Prospective Findings in Multietnic Middle Schhol Samples. *Journal of Adolescent Health*, 255-265.

Cawley, J. (2013). The economics of obesity. *NBER Reporter 4*. https://www.nber.org/reporter/2013number4/cawley.html.

CDC Tobacco Free. (2019). Health effects of cigarette smoking. Centers for Disease Control and Prevention, https://www.cdc.gov/tobacco/data_statistics/fact_sheets/health_effects/effects_cig_smoking/i ndex.htm

Centers for Disease Control and Prevention. (2014). Tobacco-related mortality. http://www.cdc.gov/tobacco/data_statistics/fact_sheets/health_effects/tobacco_related_mortality/index.htm.

Centers for Disease Control and Prevention. (2022). National Health Interview Survey, 2022. Analysis by the American Lung Association Epidemiology and Statistics Unit Using SPSS Software.

Darlen, M.E., Hotchkiss, J.L. & Pitts, M.M. (2020). Where There's Smokke…: The Wage Impact of Smoking. *Federal Reserve Bank of Atlantas's Policy Hub. No. 11*. https://doi.org/10.29338/ph2020-11.

Doll R, Peto R, Boreham J, & Sutherland I. (2004). Mortality in relation to smoking: 50 years' observations on male British doctors. *BMJ*. Jun 26;328(7455):1519.

Ekpu, V.U. & Brown, A.K. (2015). The Economic Impact of Smoking and of Reducing Smoking Prevalence: Review of Evidence, Tobacco Use Insight, *Liberta Academica*. http://www.la-press.com/tobacco-use-insights-journal-j139

Federal Trade Commission. (2023). Cigarette report for 2021. Accessed January 3, 2023. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://www.ftc.gov/system/files/ftc_gov/pdf/p114508cigarettereport2021.pdf.

Garrett, B.E., Martell, B.N., Caraballo, R.S., & King, B.A. (2019). Socioeconomic Differences in Cigarette Smoking Among Sociodemographic Groups. *Prev Chronic Dis*; 16:180553. DOI: http://dx.doi.org/10.5888/pcd16.180553

Gilleskie, D.B., Han, E., & Norton, E.C. (2017). Disentangling the contemporaneous and dynamic effects of human and health capital on wages over the life cycle. *Review of Economic Dynamics* 25, 35083. https://doi.org/10.1016/j.red.2017.02.012.

Global Burden of Disease database. (2019). Washington DC: *Institute of Health Metrics*; 2019. IHME,accessed 17 July 2023.

Gonzales, I. (2015). The Economic Burden of Somoking, *Stanford Journal fo Public Health.* https://web.stanford.edu/group/sjph/cgi-bin/sjphsite/the-economic-burden-of-smoking/.

Greenhalgh, E.M., Bayly, M., Jenkins, S., & Scollo M.M. (2023) 1.3 Prevalence of smoking—adults. In Greenhalgh, EM, Scollo, MM and Winstanley, MH [editors]. Tobacco in Australia: Facts and issues. Melbourne: *Cancer Council Victoria*; Available from http://www.tobaccoinaustralia.org.au/chapter-1-prevalence/1-3-prevalence-of-smoking-adults

Heriyani, F., Sutomo, A. H., & Saleh, Y. D. (2013). Risk factors of the incidence of pulmonary tuberculosis in Banjarmasin city, Kalimantan, Indonesia. *International Journal of Public Health*, 2(1), 1–6.

Jayani, D.H. (2022). The highest cigarette consumption comes from the poor (Konsumsi Rokok Tertinggi Berasal dari Masyarakat Miskin). dari https://databoks.katadata.co.id/datapublish/2022/01/06/konsumsi-rokok-tertinggi-berasal-dari-masyarakat-miskin#:~:text=Rokok mempengaruhi tingkat kemiskinan karena,pedesaan dan 12.22% di perkotaan

Kementerian Kesehatan Republik Indonesia (Kemenkes RI). (2022). Ministry of Health Release: GATS Survey Findings: Adult Smokers in Indonesia Increase in the Last 10 Years (Rilis Kementerian Kesehatan: Temuan Survei GATS: Perokok Dewasa di Indonesia Naik 10 tahun Terakhir). https://www.kemkes.go.id/id/rilis-kesehatan/temuan-survei-gats-perokok-dewasa-di-indonesia-naik-10-tahun-terakhir.

Kendler, K.S., Neale, M.C., Sullivan, T., Corey, L.A., Gardner, C.O., & Prescott, C.A. (1999). A population-based twin study in women of smoking intiation and nicotine dependence. *Psychological Medicine*. 29, 2999-308. DOI: 10.1017/s0033291798008022

Liew, H.-P., & Hsu, T. (2009). Smoking and health in Indonesia: the need for comprehensive intervention strategies. *Asian Population Studies*, 5(2), 189–209.

Lopez, A., Collishaw, N. & Piha T. A. (1994). Descriptive model of the cigarette epidemic in developed countries. *Tobacco Control*; 3:242-7. Available from: http://tobaccocontrol.bmj.com/cgi/reprint/3/3/242.pdf

Mason, K. (2012). The unequal weight of discrimination: Gender, body size, and income inequality. *Social Problems 59(3)*, 411–35. https://doi.org/10.1525/sp.2012.59.3.411.

Meilisa, Y., Nugroho, D., Luntungan, N.NHW., & Darnarnto, T. (2022). The 2019 economi cost of smoking-atributable diseases in Indonesia, *BJ Journals, Vol 31*. Pp. 131 - 139

(http:// dx. doi. org/ 10. 1136/ tobaccocontrol- 2021- 056890).

Ritchie,H. & Roser, M. (2023). Smoking, Published online at OurWorldInData.org. Retrieved from: 'https://ourworldindata.org/smoking' [Online Resource],

Roser, M. (2021). "Smoking: How large of a global problem is it? And how can we make progress against it?" Published online at *OurWorldInData.org*. Retrieved from: 'https://ourworldindata.org/smoking-big-problem-in-brief' [Online Resource]

Sari, N. R. (2023). Cigarette Consumption Contributes to Poverty in Indonesia (*Konsumsi Rokok Menyumbang Kemiskinan di Indonesia*). https://yankes.kemkes.go.id/view_artikel/2066/konsumsi-rokok

Siddiqi, K., Husain, S., &Vidyasagaran, A. *et al.* (2020). Global burden of disease due to smokeless tobacco consumption in adults: an updated analysis of data from 127 countries. *BMC Med* 18, 222.

Simon-Morton, B.G. (2002) Prospective Analysis of Peer and Parent Influencde on Smoking Initiation Among Early Adolescents. *Prevention science*, 3(4), 275-283. DOI: 10.1023/a:1020876625045

Sreeramareddy, C. T., & Pradhan, P. M. (2015). Prevalence and Social Determinants of Smoking in 15 Countries from North Africa, Central and Western Asia, Latin America and Caribbean: Secondary Data Analyses of Demographic and Health Surveys. *PloS one*, 10(7), e0130104. https://doi.org/10.1371/journal.pone.0130104.

The Lancet Public Heath, (2022). Cigaret Smoking. https://www.thelancet.com/pb-assets/Lancet/infographics/cigarette-smoking-2022/cigarette-smoking-2022-1664362104787.pdf.

Tobacconomics (2021). Tobacco Atlas. https://tobaccoatlas.org/challenges/prevalence/

Wang, G., Wu, L. (2020). Healthy People 2020: Social Determinants of Cigarette Smoking and Electronic Cigarette Smoking among Youth in the United States 2010–2018. *Int J Environ Res Public Health*; 17(20): 7503. Doi: 10.3390/ijerph17207503.

Wood, L., Greenhalgh, E.M., Vittiglia, A., & Hanley-Jones, S. (2019) Factors influencing uptake by young people: overview. In Scollo, MM and Winstanley, MH [editors]. *Tobacco in Australia: Facts and issues*. Melbourne: Cancer Council Victoria; Available from: https://www.tobaccoinaustralia.org.au/chapter-5-uptake/5-2-factors-influencing-uptake-by-young-people-ove

www.kemkes.go.id. (2018). Distopia Rokok. Terjebak Nikmat dalam Jerat Kematian dan Kemiskinan. https://promkes.kemkes.go.id/?p=8524&PageSpeed=noscript.

The Asian Institute of Research
Economics and Business Quarterly Reviews
Vol.7, No.1, 2024: 140-151
ISSN 2775-9237

DOI: 10.31014/aior.1992.07.01.565

Impacts of Inequality and Poverty on COVID-19 in Indonesia

Nur Setyowati[1], Nur Sabila Soraya Amalina[2]

[1] International Business Department, National Kaohsiung University of Science and Technology, Kaohsiung, Taiwan
[2] College of Business, Southern Taiwan University of Science and Technology, Tainan, Taiwan

Abstract
Purpose: The purpose of this study was to investigate how inequality and poverty contributed to COVID-19 cases and mortality using panel regression. Design/methodology/approach: The data cover semiannual observations during the COVID-19 period spanning from 2019 to 2022 in 34 provinces in Indonesia. This study split samples into high- and low-inequality provinces and apply the fixed effect panel regression on COVID-19 cases and mortality. Findings: The results suggest that the effect of inequality on the spread of COVID-19 was greater in low-inequality provinces. Whereas poverty and unemployment positively influenced the total cases in high-inequality provinces. The variable of unmet health facility had a negative impact on COVID-19 cases, but education positively influenced COVID-19 cases. There were identical results for all the variables when looking at COVID-19 mortality, except for unemployment. Unemployment showed a positively significant influence on COVID-19 mortalities in all samples, whereas it only influenced COVID-19 cases in high-inequality provinces. Originality/value: the most crucial outcome of this study concerns the distinctive implications for different types of inequality and their impact on COVID-19.

Keywords: COVID-19, Inequality, Poverty

1. Introduction

The COVID-19 pandemic, first identified in Wuhan, China, in December 2019, has threatened major economic interests and businesses, as well as human life. The worldwide economic fallout from the COVID-19 pandemic included a drop in GDP, a slowdown in the business sector, and an increasing unemployment rate. Countless people lost their livelihoods and had to change their work and social interactions due to COVID-19. The severe impact of the pandemic is shown in the increasing number of people experiencing income inequality and living in poverty. Vulnerable groups such as women, those with little education, and informally employed people in urban areas were the most affected. Many women dropped out of the labor force to supervise children during online learning and to take care of older relatives. In urban areas, social distancing and self-isolation requirements pushed workers to work remotely, leaving informal employees and those with low education levels at a disadvantage.

The effect of COVID-19 has been an extreme increase in global poverty. As the result of the pandemic, about 97 million people are living on less than $1.90 a day, increasing the global poverty rate from 7.8 to 9.1%. Inequality has also worsened due to poorer households having lost income and employment opportunities at a higher rate

than richer households (Sánchez-Páramo et al. 2021). Hence, while large numbers of people have been pushed into poverty, some have become wealthier. Ferreira (2021) suggested that the pandemic worsened inequality and widened the income gap within countries. There is evidence that people entering work during a recession earn less compared to fellow workers beginning just before or after a recession. By causing a global recession, COVID-19 created new inequality among young people who entered the labor force during the pandemic. Similarly, Stancheva (2022) found that vulnerable groups such as low-income workers were affected severely by the COVID-19 pandemic, and their recovery has been slower than other groups.

In Indonesia, a study conducted by Suryahadi et al. (2020) examined the impact of COVID-19 on poverty levels. Assuming an economic growth rate of 1%, the poverty rate will surge from 9.2% to 12.4%, resulting in an additional 8.5 million people falling into poverty. Indonesia has seen a significant impact from the SARS-CoV-2 infection. Lindsey and Mann (2020) mention that the Indonesian government has faced criticism, both domestically and internationally, for its perceived delay in responding to the onset of the epidemic. In February, when Singapore and Malaysia experienced a significant increase in the transmission of the virus, Indonesia said that it had no reported instances of COVID-19. At that time, neighboring countries of Indonesia were implementing widespread testing and imposing limitations on movement in order to control the spread of the virus inside their communities (McCurry et al. 2020). Nevertheless, Indonesia begrudgingly permitted partial school closures and advocated for remote employment. Without stringent containment measures, the number of COVID-19 fatalities in Indonesia escalated to surpass all other countries in Southeast Asia (CNN, 2021).

Studying the impacts of COVID-19 in Indonesia is crucial due to the country's vast territory and uneven population distribution between rural and urban areas. Structural disparities such as those related to socioeconomic status and ethnic background are also large in Indonesia, and these pose challenges in distinguishing between prosperous and disadvantaged areas and their response during a pandemic. Hence, the objective of this study is to examine the influence of poverty and inequality on the incidence and mortality rates of the virus, with a specific focus on the cities with low and high inequality.

This research examines the progression of disparities in Indonesia in multiple areas of society, encompassing poverty, inequality, income levels, unemployment, health facilities, and education. This paper contributes to the existing research on COVID-19 by tackling the enduring disparities that existed before the COVID-19 pandemic and looking at how those impacted the course of the pandemic. Our research differs from the previous work, as we provide a framework to help conceptualize the different potential COVID-19 interventions among people experiencing different levels of inequality.

The subsequent analysis examines the progression of the pandemic in Indonesia, elucidates the estimated linear model, incorporates socioeconomic factors, deliberates on the findings, and ultimately finishes with comprehensive conclusions. Furthermore, the article presents an examination of the progression of COVID-19 in Indonesia.

2. Conceptual Framework

2.1 COVID-19 and Inequality

The COVID-19 pandemic has significantly impacted economic disparity, making it difficult to evaluate its effects. Aspachs et al. (2022) stated that without government intervention, inequality would have surged due to job losses and wage reductions for low-income individuals. However, this increase has been mostly offset by public payments and unemployment insurance systems. Aspachs et al. (2022) used extensive and reliable microdata from previous records to monitor the impact of economic disparity on various demographic segments in the aftermath of the COVID-19 pandemic. The researchers used data sourced from Caixa Bank, the second largest financial institution in Spain, to conduct an analysis of payroll and benefits for a workforce of over three million individuals. Monthly GINI indices were computed to assess the effectiveness of public benefits in mitigating inequality. Findings indicate that the absence of public benefit programs would have led to a significant rise in inequality, mostly impacting individuals with low wages. The activation of public benefits following the pandemic has helped

to alleviate the impact of the crisis on inequality. Martinez-Bravo and Sanz (2021) conducted a study on the impact of the COVID-19 pandemic on Spanish households using two online surveys. The study involved 2,678 individuals, aged 18 and above, who provided information on income, occupation, and well-being. The results showed that the poorest households experienced larger shocks than the richer ones. The study computed the GINI coefficient at three different points in time: 2019, May 2020, and November 2020, resulting in estimates of 0.36, 0.39, and 0.38, respectively. Amate-Fortes and Guarnido-Rueda (2023) found a significant link between inequality and COVID-19 fatality rates in Spain. This result agreed with the study by Chakrabarty et al. (2023), which found higher inequality accelerated the spread of COVID-19.

2.2 COVID-19 and Income

O'Donoghue et al. (2020) used the European Union Survey on Income and Living Conditions to analyze the impact of the pandemic on Ireland's income distribution, finding a 20.64% increase in market income and a 6.62% decline in disposable income. Zhang et al. (2022) mentioned that the COVID-19 epidemic is believed to have exacerbated economic inequality in China by impacting the per capita income of various families. On one hand, Wang et al. (2021) found that rural inhabitants may have experienced more significant declines in income compared to urban residents due to the fact that rural workers have less stable employment arrangements, with migratory workers from rural regions restricted to their villages and unable to resume work in cities. Conversely, Almeida et al. (2021) found that the epidemic disproportionately affected low-income households compared to their more privileged counterparts, thereby worsening economic inequality. Luo et al. (2020) performed a survey that revealed that 7.1% of rural families in China are at risk of experiencing poverty as a result of the pandemic. Additionally, 23% of those who had previously emerged from poverty have been likely to regress back into it.

2.3 COVID-19 and Unemployment

Unemployment rates are positively correlated with COVID-19, even when using viral incidence rates as the dependent variable. Amate-Fortes and Guarnido-Rueda (2023) stated that high unemployment levels in municipalities increased employment instability and teleworking challenges, increasing vulnerability to contagion. Factors like stress and social alienation also contributed to unemployment. Mirahmadizadeh et. al. (2022) point out similar findings, stating that unemployment is potentially a measurement factor of low socioeconomic status, malnutrition, and low social support, all factors that affect COVID-19-associated outcomes. According to Samarah, W.A (2021), the Palestinian economy had adverse effects as a result of the COVID-19 pandemic during the period of quarantine, resulting in a rise in unemployment rates. Nevertheless, following the epidemic, the rate of unemployment decreased, and the economy returned to its usual state. The level of competitiveness remained stable due to the ample availability of labor and human resources.

2.4 COVID-19 and Poverty

McKibbin and Fernando (2021) found that the COVID-19 pandemic and its associated measures led to a significant economic decline, with negative GDP growth observed in numerous nations; moreover, the study by Bonaccorsi et al. (2020) suggests that this could potentially impact poverty and income inequality levels. Bukari et al. (2022) revealed a direct correlation between COVID-19 and poverty and food insecurity, with households with COVID-19-infected individuals experiencing a significant increase in poverty levels and food insecurity levels compared to non-COVID-19-affected households, indicating that COVID-19 worsened these issues. The global nature of the COVID-19 pandemic and its restrictive social measures necessitate prompt understanding of its impact on inequality and poverty to develop effective policy responses.

2.5 COVID-19 and Healthcare

Abedi et al. (2020) argues that the virus had a substantial influence on the population in terms of racial, economic, and health disparities, leading to increased vulnerability and mortality rates. The aforementioned arguments have been employed by Patel et al. (2020) to elucidate the reasons behind the heightened susceptibility of those experiencing economic deprivation to the COVID-19 pandemic. Several reasons contribute to the issue at hand,

namely stress, comorbidities linked to poverty, and limited healthcare accessibility. Mahendradhata et al. (2021) mentioned that the COVID-19 pandemic severely impacted a healthcare system that was already weak, particularly in terms of its general capacity and fairness in distributing resources across different regions. There are substantial disparities in the availability and standard of healthcare services across different regions, which provided further challenges in managing the spread of COVID-19 when cases became widespread in both urban and rural areas. Suparmi et al. (2018) demonstrated significant disparities in public health development among provinces using a composite index of 30 variables. The index scores ranged from 44 in Papua (representing the lowest level) to 65 in Bali (representing the highest level).

2.6 COVID-19 and Education

Lee and Son (2018) suggest that the link between education and health literacy is influenced by social factors, with lower education levels linked to lower socioeconomic status, increasing cognitive impairment due to inadequate nutrition, reduced healthcare access, and social isolation. According to Joana et al. (2021), persons who are male, older, have more education, and belong to the risk factor group are more likely to have a higher IHK-COV19 globally. They also reveal that education levels are a strong predictor of health outcomes. Increased degrees of higher education are associated with enhanced health knowledge. This finding suggests that those with lower levels of education may require more significant enhancements in their health literacy.

According to Andrew et al. (2020), children's learning experiences during COVID-19 lockdown varied significantly depending on family wealth. Not only did children from higher-income households spend different amounts of time studying, they also had different access to resources at home and in schools. Bacher-Hicks et al. (2021) investigated in real time, using high-frequency internet search data, how U.S. families looked for online learning materials when schools closed. Searches for online learning materials increased significantly more in urban areas with better internet connection and higher incomes. Jaeger and Blaabæk's (2020) research in Denmark likewise implied that during the epidemic, learning opportunities for higher income groups were likely more abundant.

3. Data and Methods

The data were mainly derived from the Statistic Indonesia database (BPS), with the exception of the COVID-19 cases and mortality, which were taken from corona case update Andrafarm.com. We covered semiannual observations during the COVID-19 period spanning from 2019 to 2022 in 34 provinces in Indonesia. We then divided the samples into high- and low-inequality groups. We assumed that when the GINI coefficient was larger than 0.39 the sample could be regarded as a high-inequality province, and where the value was lower than 0.39, it could be considered a low-inequality province (Appendix A.1). Table 1 and Table 2 represent the data definitions and sources, together with the analytical statistics for all the variables used in our analysis and the correlation between each variable. The highest standard deviation reported in Table 1 was 11.33 in education, followed by unmet health facilities and unemployment (1.84 and 1.77, respectively). Meanwhile, the lowest standard deviation was within 0.04 for the GINI index. Table 2 shows that the highest correlation between the independent variables was found with unmet health facility and income (-0.60).

Table 1: Variable Definitions and Summary Statistics.

Variable	Definition	Mean	Std. Dev	Min	Max
Cases	Log of the number of confirmed COVID-19 cases within the region. Sources: Corona Case Update AndraFarm.com. https://m.andrafarm.com/_andra.php?_i=daftar-co19-kota-sumber#sumber1. Access Time: August 3, 2023	3.55	1.69	0	6.10
Mortality	Log of the number of death cases as a result of COVID-19, Sources: Corona Case Update AndraFarm.com. https://m.andrafarm.com/_andra.php?_i=daftar-co19-kota-sumber#sumber1. Access Time: August 3, 2023	2.20	1.29	0	4.50

GINI	The distribution of income across population. Sources: BPS - Statistics Indonesia. Source Url: https://www.bps.go.id/indicator/23/98/2/gini-ratio-menurut-provinsi-dan-daerah.html. Access Time: April 11, 2022	0.35	0.04	0.24	0.441
Poverty	Log of the estimated minimum expenditure to fulfil the basic needs of life in a month (IRD/month). Sources: BPS - Statistics Indonesia. https://www.bps.go.id/indicator/23/195/1/garis-kemiskinan-rupiah-kapita-bulan-menurut-provinsi-dan-daerah-.html. Access Time: April 18, 2022	5.57	0.11	5.41	6.72
Unemployment	The percentage of unemployed people. Sources: BPS - Statistics Indonesia. Source Url: https://www.bps.go.id/indicator/6/543/1/unemployment-rate-by-province.html. Access Time: April 18, 2022	5.22	1.77	1.25	10.95
Unmet Health Facilities (UHF)	The percentage of people with health problems and the health services actually received (%). Sources: BPS - Statistics Indonesia. https://www.bps.go.id/indicator/30/1402/1/unmet-need-pelayanan-kesehatan-menurut-provinsi.html. Access Time: August 3, 2022	4.75	1.84	1.28	10.73
Income	Log of average of net income per month of casual worker by province and main industry (IRD thousand). Sources: BPS - Statistics Indonesia. https://www.bps.go.id/statictable/2022/06/29/2198/rata-rata-pendapatan-bersih-pekerja-bebas-menurut-provinsi-dan-kelompok-umur-2022-2023.html. Access Time: August 3, 2022	3.17	0.09	2.86	3.44
Number of Poor People (NPP)	Log of the number of people living below poverty line (thousands). Sources: BPS - Statistics Indonesia. Source Url: https://www.bps.go.id/indicator/23/185/1/jumlah-penduduk-miskin-ribu-jiwa-menurut-provinsi-dan-daerah.html. Access Time: August 3, 2022	2.62	0.47	1.69	3.66
Education	The percentage of people graduated from high school (%). Sources: BPS - Statistics Indonesia. Source Url: https://www.bps.go.id/indicator/28/1980/1/tingkat-penyelesaian-pendidikan-menurut-jenjang-pendidikan-dan-provinsi.html. Access Time: April 18, 2022	63.88	11.33	5.82	90.12

Table 2: Correlation Results

	Cases	Mortality	GINI	Poverty	Unemployment	UHF	Income	NPP	Education
Cases	1.00								
Mortality	0.96*	1.00							
GINI	0.07	0.09	1.00						
Poverty	0.06	0.04	-0.45*	1.00					
Unemployment	0.29*	0.31*	0.05	0.14	1.00				
UHF	-0.22*	-0.20*	0.13	-0.41	-0.35*	1.00			
Income	-0.06	-0.07	-0.05	0.40*	0.38	-0.60*	1.00		
NPP	0.17*	0.25*	0.40*	-0.35*	0.17	0.21	-0.31*	1.00	
Education	0.26*	0.29	0.07	0.06	0.40*	-0.31	0.14	-0.15	1.00

We estimated panel regression in order to explain COVID-19 cases and mortality as functions of income inequality and poverty, and a number of control variables, including unemployment, unmet health facilities, income, number of poor people, and education. Along with the full set of samples, we divided the samples into high- and low-

inequality categories according to their GINI coefficients. We first applied the Hausman test to determine whether fixed effect or random effect was a better fit to the data. The Hausman's test result showed that fixed effect was consistent throughout the data. Hence, we continued to perform panel fixed-effect regression for the total cases and mortality of COVID-19.

The following model was used:

$$COVID19_{it} = \alpha + \beta_1 GINI + \beta_2 Income + \beta_3 Unemployment + \beta_4 PL + \beta_5 NPP + \beta_6 UHF + \beta_7 Education + \varepsilon_{it}$$

where COVID-19 is the dependent variable, which consists of two variables: COVID-19 cases and mortality rate. The objective was to first analyze how the independent variable affected the total number of cases of COVID-19 virus infection, and finally check how the independent variable effected the COVID-19 mortality rate.

GINI is the explanatory variable, which we used to measure inequality. The GINI index extends the income distribution across the population and measures the deviation from a perfectly equal distribution. A GINI index of 0 illustrates perfect equality, while an index of 1 shows perfect inequality.

Income refers to an individual's monthly average net income. Income, similar to the GINI index, is also a variable to measure inequality. Income data from casual workers, who are employed people who have a temporary employment contract or who work when needed, are included in the data. Compared to permanent or regular employment, this type of casual work has limited benefits and job security. The employees do not have active relationships with their employers and cannot file complaints. Hence, temporary workers exhibit more income inequality compared to full-time employees.

Unemployment is a situation in which a person does not have a job. The unemployment level is one of the measures of a healthy economy. In this study, unemployment was represented by the percentage of unemployed people in each province.

Poverty is defined as a lack of financial resources to meet essential needs. We used the poverty line (PL) as the measurement of the poverty level within a region. In this sense, we calculated the monthly estimated minimum expenditure to fulfill the basic needs of life in each region (IDR/Month).

NPP represents the number of poor people living below the poverty line. This variable was the proxy variable used to examine how poverty affected both COVID-19 cases and mortality.

UHFs are the unmet health facilities. Unmet health facilities represent the percentage of people with health problems compared to the health services actually received. This variable was used to measure how the health facilities influenced the cases and mortality caused by the COVID-19 virus.

Education refers to the percentage of people who graduated from high school. We assumed that regions with higher education levels had fewer COVID-19 effects, as people were more aware of their health and environment.

4. Results and Discussion

Table 3 presents the results of panel regression of the model for COVID-19 cases. The GINI results exhibited significantly negative coefficients in the nation overall and in provinces with low inequality but were insignificant in high-inequality provinces. The GINI coefficient was larger in low-inequality provinces compared to the nation. Similar to the GINI results, the inequality measurement of income was also significantly negatively correlated with COVID-19 cases in all the samples. Both inequality variables, GINI and income, demonstrate how the increase in wage inequality during the pandemic was associated with a reduction in COVID-19 cases. This result is due to the loss of jobs and the increase in remote work caused by the pandemic. Even though the spread of COVID-19 decreased as more people worked at home, these unequal jobs created higher inequality in the society. Bick et al. (2023), Irlacher and Koch (2021), and Bonacini et al. (2021) confirm that high-income workers were more able to work from home and earn a premium wage compared to low-income workers. They also found that

workers who were able to work remotely earned more, deepening the inequality between the workers who could work from home and those who could not.

Table 3: Estimation Results (Cases)

	Nation	Low	High
GINI	-52.05***	-69.94***	19.82
	(-4.24)	(-4.93)	(1.19)
Income	-11.16***	-11.15***	-4.87*
	(-4.40)	(-3.85)	(-1.88)
Poverty	2.02*	1.28	25.93***
	(1.68)	(1.04)	(4.47)
NPP	24.19***	23.40***	7.74*
	(4.80)	(3.74)	(1.70)
Unemployment	0.16	0.20	0.24**
	(1.23)	(1.21)	(2.21)
UHF	-0.48***	-0.39***	-0.05
	(-5.30)	(-3.64)	(-0.55)
Education	0.15***	0.13***	0.36***
	(7.88)	(6.54)	(7.10)
R2	0.62	0.62	0.61

Notes: The t-test is reported in parentheses, ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Our results also suggest that the effect of inequality on the spread of COVID-19 was greater in low-inequality provinces. As stated by Stancheva (2022), remote work may drive regional inequality, as working from home is not feasible for everyone. Remote jobs were less feasible in low-income-disparity regions, as most of these regions are industrial or rely on tourism, and these were the sectors most affected by COVID-19 because of travel restrictions. Hence, COVID-19 cases decreased due to travel restrictions; however, many workers lost their jobs and needed to find new employment to earn an income, resulting in higher income inequality in these regions. Moreover, the spread of COVID-19 escalated in low-inequality provinces as these are usually poor regions with limited access to health care and less access to government health warnings.

In the nation and in high-inequality provinces, the coefficient of poverty was significantly positive despite being insignificant in low-inequality provinces. Therefore, the number of poor people, which is another measurement of poverty, had a positive influence on the COVID-19 cases in all samples. People living in poverty had a higher risk of COVID-19 transmission, as they tend to live in overcrowded accommodations, do not have access to remote work options, have unstable work and income, and have less access to health care (Patel et al., 2020). Hence, an increase in poverty will increase the number of COVID-19 cases.

Comparing the size of the coefficient in each sample, the results show that poverty highly influenced the total cases in high-inequality provinces (10 times the coefficient in the nation). These results point out the substantial link between inequality and poverty. Inequality worsens economic conditions and creates instability through mechanisms in which the rich spend less of their income compared to people with lower incomes, and the poor borrow money to fulfill their basic needs, leading to the default of consumer loans. Kumhof and Ranciere (2010) reported that as the rich save money, while the poor must spend money, there will be aggregate demand reduction, which results in unemployment. In return, governments decrease interest rates in response to the decrease in demand, resulting in asset bubbles such as rising housing prices. Inequality growth could lead to catastrophic consequences, especially for people living under the poverty line, as small increases in unemployment and interest rates lower the ability of poor people to settle their consumer and mortgage loans, triggering financing default. In addition, poor people living in cities with massive inequality are at high risk of contracting COVID-19 as they do not have enough privilege to access health care and often live in high-density communities.

Unemployment was found to be positively correlated with COVID-19 cases in high-inequality provinces, where it did not have any influence in the nation and in low-inequality provinces. This is perhaps due to high-inequality

provinces having more unemployment compared to low-inequality regions. People without work cannot afford good health care services, yet live in crowded neighborhoods, making them the most vulnerable to COVID-19 infection. Mirahmadizadeh et al. (2022) also point out similar findings, stating that unemployment is potentially a measurement factor of low socioeconomic status, malnutrition, and low social support, all factors that affect COVID-19-associated outcomes.

The variable of unmet health facility was found to have a negative impact on the COVID-19 cases in the nation and in low-inequality provinces but no impact in provinces with high inequality. At the time, the government announced physical distancing and stay-at-home measures. During the COVID-19 pandemic, people gradually reduced their need to go to hospitals or medical facilities. People with mild symptoms recovered at home and did not need go to hospital. This practice helped reduce the spread of COVID-19, and potentially reduced the hazards faced by older and more vulnerable patients. That is to say, increases in unmet health facilities reduced COVID-19 cases due to people being isolated at home.

Education positively influenced COVID-19 cases in all samples. Compared to other variables, the impact of education was relatively small in the nation and in low-inequality regions, potentially due to the government regulations, including wearing masks, hand washing, maintaining distance, and home isolation, that applied to all society and were not limited by education. This guidance needed to be followed by all people, and there was a punishment for breaking these rules. Hence, there was a low influence of education during COVID-19. This result is similar to that found by Rattay et al. (2021) who discovered that the differences in behavior between people with different education levels were relatively small during the pandemic.

After looking at the total number of cases of COVID-19, we analyzed the mortality caused by COVID-19 and how it was related to changes in income inequality and poverty, along with a number of control variables. The results of the fixed-effect panel regression are presented in Table 4. Each variable in Table 4 exhibits similar results to those shown in Table 3, except for unemployment. This result shows that unemployment had a positively significant influence on COVID-19 mortalities in all samples, whereas it had a positive influence on the total COVID-19 cases only in high-inequality provinces.

Table 4: Estimation Results (Mortality)

	Nation	Low	High
GINI	-34.63***	-48.63***	19.08
	(-3.69)	(-4.48)	(1.55)
Income	-7.01***	-7.03***	-2.60
	(-3.65)	(-3.17)	(-1.36)
Poverty	2.06**	1.50	24.13***
	(2.24)	(1.59)	(5.62)
NPP	15.82***	14.32***	5.78*
	(4.11)	(2.99)	(1.72)
Unemployment	0.21**	0.28**	0.18**
	(2.10)	(2.23)	(2.30)
UHF	-0.36***	-0.30***	-0.03
	(-5.19)	(-3.55)	(-0.44)
Education	0.10*	0.09***	0.21***
	(1.82)	(5.61)	(5.60)
R2	0.59	0.59	0.81

Notes: The same as Table 3.

The link between unemployment and COVID-19 mortality was also found by Von Watcher (2020) and Bianchi et al (2023). Both studies conclude that the long-term effect of unemployment during COVID-19 increased the economic distress and took a toll on human beings. The link between unemployment and mortality during COVID-19 might be due to indirect causes such as decreases in income which forced people to live in high-density communities, lessened their ability to access good health care, and prolonged stress that caused mental and physical health problems.

In order to check the robustness of the results we excluded the lowest and highest values, or the 5% and 95% rate, for the dependent variables, cases and mortality, as well as for the GINI index, as an independent variable. The results of this check for robustness are shown in Table 5. They show similar findings to the results for the full sample shown in Tables 3 and 4. Hence, we conclude our results are robust within all samples.

Table 5: Robustness Test Results

	Cases	Mortality
GINI	-54.75*** (-4.44)	-36.80*** (-3.90)
Income	-10.77*** (-4.22)	-6.74*** (-3.45)
Poverty	1.93* (1.62)	2.00** (2.18)
NPP	25.43*** (5.02)	16.73*** (4.32)
Unemployment	0.16 (1.19)	0.21** (2.07)
UHF	-0.45*** (-4.99)	-0.34*** (-4.87)
Education	0.15*** (7.82)	0.10*** (6.82)
R2	0.62	0.58

Notes: The same as Table 3.

5. Conclusions

This study investigated the relationships between inequality, poverty, unemployment, unmet health facilities, and education on COVID-19 cases and mortality in 34 Indonesia provinces. The study contributes to the socioeconomic knowledge of COVID-19 and the effects of the different levels of inequality in various regions during the COVID-19 pandemic.

The findings from the study suggest that the effect of inequality on COVID-19 spread was greater in low-inequality provinces. Whereas poverty and unemployment positively influenced the total cases in high-inequality provinces. The variable of unmet health facility had a negative impact on COVID-19 cases, but education positively influenced COVID-19 cases. There were identical results for all the variables from the investigation of COVID-19 mortality, except for unemployment. Unemployment showed a positively significant influence on COVID-19 mortalities in all samples, whereas it only influenced COVID-19 cases in high-inequality provinces.

Perhaps the most crucial outcome of this study concerns the distinctive implications for different types of inequality. In provinces with high income inequality, the government should focus on poverty and unemployment to address COVID-19 spread and mortality. Government policies to reduce unemployment and maintain the availability of new jobs are necessary in the high-inequality regions. Unemployment is often caused by poverty, especially in urban environments with poor living communities. Both demand- and supply-side policies are necessary to successfully reduce unemployment. On the demand side, the government could directly employ more people in the public sector and stimulate demand of products that could lead firms to employ more people. On the supply side, increasing employment skills through training and hiring support information is needed. The government could act as an agent to match workers to available jobs, reducing market failure or misinformation.

Therefore, provinces with low income inequality should maintain their inequality level to avoid severe outcomes from future pandemics. Multiple studies have suggested that income inequality is related to people's happiness; therefore, steady low inequality relieved people from uncertain conditions during COVID-19. The government could reduce income inequality through increased tax payments for high-income earners, tax relief for low-income earners, providing welfare services for poor people, and maintaining the availability of health services, schools, and affordable housing to increase living conditions and reduce inequality in the society.

Author Contributions: All authors contributed to this research.

Funding: Not applicable.

Conflict of Interest: The authors declare no conflict of interest.

Informed Consent Statement/Ethics Approval: Not applicable.

References

Abedi V, Olulana O, Avula V, Chaudhary D, Khan A, Shahjouei S, Li J, Zand R. (2021). Racial, Economic, and Health Inequality and COVID-19 Infection in the United States. *J Racial Ethn Health Disparities*, 8(3):732-742. doi: 10.1007/s40615-020-00833-4.

Ahmed, T., Rahman, A.E., Amole, T.G. *et al.* (2021). The effect of COVID-19 on maternal newborn and child health (MNCH) services in Bangladesh, Nigeria and South Africa: call for a contextualised pandemic response in LMICs. *Int J Equity Health*, 20(77). https://doi.org/10.1186/s12939-021-01414-5

Almeida, V., Barrios, S., Christl, M. De Poli, S., Tumino, A., and Wielen, W.V.D., (2021). The impact of COVID-19 on households´ income in the EU. *J Econ Inequal* , 19, 413–431. https://doi.org/10.1007/s10888-021-09485-8

Amate-Fortes, Ignacio, and Almudena Guarnido-Rueda. (2023). Inequality, public health, and COVID-19: an analysis of the Spanish case by municipalities. *Eur J Health Econ*, 24, 99–110. https://doi.org/10.1007/s10198-022-01455-9

Aspachs, Oriol, Ruben Durante, Alberto Graziano, Josep Mestres, Jose G Montalvo, and Marta Reynal-Querol. (2022). Real-time inequality and the welfare state in motion: evidence from COVID-19 in Spain. *Economic Policy,* 37(109), 165-199. https://doi.org/10/1093/epolic/eiac008

Bacher-Hicks, A., Goodman, J., & Mulhern, C. (2021). Inequality in household adaptation to schooling shocks: Covid-induced online learning engagement in real time. *Journal of Public Economics,* 193, 104345. doi:10.1016/j.jpubeco.2020.104345

Bick, Alexander, Adam Blandin, and Karel Mertens. (2023). "Work from Home before and after the COVID-19 Outbreak." *American Economic Journal: Macroeconomics*, 15(4): 1-39**.** DOI: 10.1257/mac.20210061

Bonaccorsi, G., Pierri, F., Cinelli, M., Flori, A., Galeazzi, A., Porcelli, F., Schmidt, A. L., Valensise, C. M., Scala, A., Quattrociocchi, W., & Pammolli, F. (2020). Economic and social consequences of human mobility restrictions under COVID-19. *Proceedings of the National Academy of Sciences of the United States of America*, 117(27), 15530–15535. https://doi.org/10.1073/pnas.2007658117

Bonacini, L., Gallo, G & Scicchitano, S. (2021). Working from home and income inequality: riks of a 'new normal' with COVID-19. *J Popul Econ,* 34, 303-360. https://doi.org/10.1007/S00148-020-00800-7

Bukari, C., Aning-Agyei, M.A., Kyeremeh, C. *et al.* (2022). Effect of COVID-19 on Household Food Insecurity and Poverty: Evidence from Ghana. *Soc Indic Res,* 159, 991–1015. https://doi.org/10.1007/s11205-021-02766-9

Chakrabarty, Ebajyoti, Bhanu Bhatia, Maneka Jayasinghe, and David Low. (2023). Relative deprivation, inequality and the Covid-19 pandemic. *Social Science & Medicine*, 324, https://doi.org/10.1016/j.socscimed.2023.115858.

Ferreirea, F.H.G. (2021). INEQUALITY IN THE TIME OF COVID-19. *International Monetary Fund. FINANCE & DEVELOPMENT*, 20-23.

Gomes da Silva J, Silva CS, Alexandre B and Morgado P (2021) Education as a Predictor Factor for Knowledge of COVID-19 in Portugal. Front. Public Health. 9 (680726). doi: 10.3389/fpubh.2021.680726

Irlacher, Michael and Koch, Michael. (2021). "Working from Home, Wages, and Regional Inequality in the Light of COVID-19" *Jahrbücher für Nationalökonomie und Statistik*, 241(3), 373-404. https://doi.org/10.1515/jbnst-2020-0030

Jæger, M. M., & Blaabæk, E. H. (2020). Inequality in Learning Opportunities during Covid-19: Evidence from Library Takeout. *Research in Social Stratification and Mobility, 100524.* doi:10.1016/j.rssm.2020.100524

Kumhof, M., Rancière, R. (2010). Inequality, Leverage and Crises. IMF Working Paper. WP/10/268. Available online at https://www.imf.org/external/pubs/ft/wp/2010/wp10268.pdf

Lindsey, T., & Mann, T. (2020, April 9). Indonesia was in denial over coronavirus: now it may be facing a looming disaster. The Jakarta Post. https://doi.org/10.1017/CBO9781107415324. 004

Lee JK, Son YJ. (2018). Gender Differences in the Impact of Cognitive Function on Health Literacy among Older Adults with Heart Failure. *Int J Environ Res Public Health*, 15(12), 2711. doi: 10.3390/ijerph15122711.

Luo, R.. Liu, C., Gao, J., Wang, T., Zhi, H., Shi, P., & Huang, J. (2020). Impacts of the COVID-19 pandemic on rural poverty and policy responses in China. *Journal of Integrative Agriculture,* 19(12), 2946–2964. https://doi.org/10.1016/S2095-3119(20)63426-8

Mahendradhata Y, Andayani NLPE,Hasri ET, Arifi MD, Siahaan RGM,Solikha DA and Ali PB. (2021). The Capacity of the Indonesian Healthcare System to Respond to COVID-19. *Public Health*, 9:649819.

Martinez-Bravo, M., Sanz, C. (2021). Inequality and psychological well-being in times of COVID-19: evidence from Spain. *Series* 12, 489–548. https://doi.org/10.1007/s13209-021-00255-3

McCurry, J., Ratcliffe, R., Davidson, H. (2020). Mass testing, alerts and big fines: the strategies used in Asia to slow coronavirus. https://www.theguardian.com/world/2020/mar/11/mass-testing-alerts-and-big-fines-the-strategies-used-in-asiato-slow-coronavirus.

McKibbin, W., & Fernando, R. (2020). The Global Macroeconomic Impacts of COVID-19: Seven Scenarios. *Asian Economic Papers,* 1–55. doi:10.1162/asep_a_00796

Mirahmadizadeh, A., Shamooshaki, M. T. B., Dadvar, A., Moradian, M. J., & Aryaie, M. (2022). Unemployment and COVID-19-related mortality: a historical cohort study of 50,000 COVID-19 patients in Fars, Iran. *Epidemiology and health*, 44, e2022032. https://doi.org/10.4178/epih.e2022032

O'Donoghue, Cathal, Sologon, Denisa M. Sologon, Iryna Kyzyma, and John McHale. (2020). Modelling the Distributional Impact of the COVID-19 Crisis. *Fiscal Studies,* 41, 321-336. https://doi.org/10.1111/1475-5890.12231

Patel, J. A., Nielsen, F. B. H., Badiani, A. A., Assi, S., Unadkat, V. A., Patel, B., Ravindrane, R., & Wardle, H. (2020). Poverty, inequality and COVID-19: the forgotten vulnerable. *Public health*, *183*, 110–111. https://doi.org/10.1016/j.puhe.2020.05.006

Rattay, P., Michalski, N., Domanska, O. M., Kaltwasser, A., De Bock, F., Wieler, L. H., & Jordan, S. (2021). Differences in risk perception, knowledge and protective behaviour regarding COVID-19 by education level among women and men in Germany. Results from the COVID-19 Snapshot Monitoring (COSMO) study. *PloS one*, 16(5), e0251694. https://doi.org/10.1371/journal.pone.0251694

Regan Helen. (2021). Delta Varian is Ravaging the World but It's Pushing Southeast Asia to Breaking Point. Hongkong CNN. https://edition.cnn.com/2021/08/04/asia/southeast-asia-delta-covid-explainer-intl-hnk/index.html

Samarah, W.A (2021). 'Evaluating the Effect of COVID-19 on the Palestinian Economy by Estimating the Relationship Between Economic Growth and Unemployment in Palestine. *Studies in Business and Economic,* 16, 206-217. https://doi.org/10.2478/sbe-2021-0034

Carolina Sanchez-Paramo, C., Hill, R., Mahler, D.G., Yonzan, A.N. (2021). COVID-19 leaves a legacy of rising poverty and widening inequality. World Bank Blogs. https://blogs.worldbank.org/developmenttalk/covid-19-leaves-legacy-rising-poverty-and-widening-inequality

Stantcheva, Stefanie. (2022). Inequalities in the Times of a Pandemic . NBER Working Paper No. w29657, SSRN: https://ssm.com/abstract=4010506

Suryahadi, Asep, Ridho Al Izzati and Daniel Suryadarma. (2020). 'The Impact of Covid-19 Outbreak on Poverty: An Estimation for Indonesia'. *SMERU Working Paper*, SMERU Research Institute.

Zhang, Qi, Xinxin Zhang, Qi Cui, Weining Cao, Ling He, Yexin Zhou, Xiaofan Li, and Yunpeng Fan. (2022). "The Unequal Effect of the COVID-19 Pandemic on the Labour Market and Income Inequality in China: A Multisectoral CGE Model Analysis Coupled with a Micro-Simulation Approach" *International Journal of Environmental Research and Public Health* 19, 3, 1320. https://doi.org/10.3390/ijerph19031320

Appendix A.

Table A.1: High- and Low-Inequality Provinces in Indonesia

High	Low	
1. DIY	1. Aceh	14. Kep. Riau
2. DKI Jakarta	2. Bali	15. Lampung
3. Gorontalo	3. Banten	16. Maluku
4. Jawa Barat	4. Bengkulu	17. Maluku Utara
5. Papua	5. Jambi	18. NTT
6. Sulawesi Selatan	6. Jawa Tengah	19. Papua Barat
7. Sulawesi Tenggara	7. Jawa Timur	20. Riau
8. NTB	8. Kalimantan Barat	21. Sulawesi Barat
	9. Kalimantan Selatan	22. Sulawesi Tengah
	10. Kalimantan Tengah	23. Sulawesi Utara
	11. Kalimantan Timur	24. Sumatera Barat
	12. Kalimantan Utara	25. Sumatera Selatan
	13. Kep. Bangka Belitung	26. Sumatera Utara

The Asian Institute of Research
Economics and Business Quarterly Reviews
Vol.7, No.1, 2024: 152-159
ISSN 2775-9237

DOI: 10.31014/aior.1992.07.01.566

An Approach for Determining Exchange Rates: The Mixture of the Purchasing Power Parity Model and the Chartist Model

Yutaka Kurihara[1]

[1] Department of Economics, Aichi University, Aichi, Japan

Correspondence: Yutaka Kurihara, Department of Economics, Aichi University, 4-60-6 Hiraike, Nakamura, Nagoya, Aichi, 453-8222, Japan
Tel: +81-52-564-6111. E-mail: kurihara@vega.aichi-u.ac.jp

Abstract
In the medium- and long-run, prices rather than interest rates are thought to have an effect on exchange rates, and the purchasing power parity (PPP) theory, which posits as a determining factor in exchange rates, has been used not only in academic fields but also in practice. This study considers that exchange rates are determined by the mixture of past exchange rates and the PPP theory. On the other hand, it is often pointed out that the actual exchange rate diverges significantly from the exchange rate derived from the PPP theory. Moreover, this study hypothesizes that when the deviation becomes large, there will be a movement to correct the deviation. The empirical estimations show that when the deviation is large, such movement cannot be found and when the deviation is small, there is a movement toward correction.

Keywords: Exchange rate, Japan, Price, PPP (PPP), US

1. Introduction

The deterministic elements of exchange rates have been analyzed especially since the adoption of the flexible exchange rate system in the 1970s. Many studies have been presented and discussed extensively, however, a consensus has not yet been obtained. From the 1980s, as globalization of economic activities has occurred and huge money has flowed, exchange rates have fluctuated greatly. Exchange rates have been examined not only in the academic field but also in the real world from the 1980s, and some important topics could have been clarified. Recently, interest rates have been thought to be the most important deterministic elements of exchange rates. From 2022, the Japanese yen has depreciated significantly against the US dollar. The reason is considered to be the difference in interest rates between Japan and the US. In the US, soaring energy prices and labor shortages led to inflation, which the US responded to with high interest rates. Japan maintained low interest rates as deflation continued and the weaker yen was thought to have contributed to a rising in exports and to economic growth. As a result, the interest rate differential between the two economies widened, causing the yen to weaken and the dollar

to appreciate. On the other hand, it could have been thought that interest rates are short-term exchange rates' main deterministic elements.

In the medium- and long-term, prices rather than interest rates are considered to influence exchange rates, and the PPP theory, which hypothesizes prices as determining factors in exchange rates, has been employed not only in academic fields but also in practice. In the real world, the Big Mac Index is famous. The index is used to calculate exchange rates from each domestic price of a Big Mac (using the law of respective prices of the same item). This study considers that exchange rates are determined by a mixture of two concepts: the PPP theory and past exchange rates (chartist model). Along with the purchasing power hypothesis, market participants are thought to watch the past exchange rate movements in reality as many chartists do in the foreign exchange markets. The mixture of the PPP model and the Chartist model has not been examined enough, however, and it should be considered that this idea is valid both in practice and in theory. Whether this mixture model is correct or not is empirically analyzed in this study.

The structure of this study is as follows: Section 2 reviews previous research, especially focusing on the validity of the PPP. Section 3 provides the formula which is based on this mixture model for empirical analyses. The results of the empirical analyses are presented and discussed in Section 4. Finally, a brief summary is given in Section 5.

2. Previous research

The history of the PPP is very long. It has been said that the concept was first presented in the 1920s. Since then, the theory has been greatly discussed. On the other hand, exchange rates have sometimes fluctuated greatly including the yen-US dollar exchange rate. Financial transactions other than goods transactions are carried out all over the world on a tremendous scale and speed. Also, monetary authorities and governments have conducted policies which are related to exchange rates. Interventions have been conducted in many economies. Moreover, data have been provided not only of developing countries but also of developed countries. Also, new statistical methods have been used.

This study later applies the theory of the PPP. The sample period is from 1991Q1 to 2020Q4 due to the availability of data and the influence of COVID-19. This section strictly reviews recent studies.

Edison (1987) showed that one version of the PPP is insufficient to observe the relationship between the pound and the dollar. Sarantis and Stewart (1993) employed a cointegration model and found that the PPP was not found in the long-term. Darné and Hoarau (2008) suggested that the PPP did not hold in Australia between January 1977 and April 2004. Yun (2017) found that the financial channel was an element that led to divergences of the real **exchange rate** from its long-term reality. Wan et al., (2019) showed that when there exist structural changes, the PPP did not hold for China. Anjaly and Malabika (2021) indicated that the PPP was invalid for the Indian economy. Zhang et al., (2022) examined real **exchange rates** between Spain and the countries with which it traded and showed that the PPP was not valid. Tajdini et al., (2023) showed that the PPP was incorrect and also showed that participants employ a short-term approach to exchange rates.

Kanas (2006) showed that the PPP fit better in the Bretton Woods period than in the recent flexible exchange rate system. Narayan and Narayan (2007) found that Italy showed strong evidence for the **PPP**. Liu et al., (2011) suggested that the PPP fit well for three countries: Slovakia, Romania, and Bulgaria. Chang (2012) provided strong evidence for the PPP for China. Bahmani-Oskooee et al., (2014) found that the PPP holds in 34 OECD countries. Yilanci et al., (2018) showed that both the cointegration and Fourier ADL cointegration checks showed a significant relationship between the **exchange rates** and prices for 8 of 14 African countries. Gyamfi and Appiah (2019) indicated strong evidence against the PPP theory in 16 African countries. She et al., (2021) checked the unit roots real **exchange rates** of Pakistani rupees against the main international trade countries and showed that the FADF unit root test supported the PPP, while the FKPSS test confirmed the PPP for 12 **exchange rates**. Uğur and Alper (2023) examined the PPP and found that the PPP hypothesis was appropriate in about half of the OECD countries' economies, including the US.

Moreover, Kumar (2005) found that when looking at the US' real **exchange rate**, the PPP theory is valid for only France, Portugal, and Denmark, and when the German real **exchange rate** is employed, the PPP theory fits for Austria, Belgium, Norway, Spain, the Netherlands, Switzerland, and Denmark. Papell (2006) indicated that when the dollar appreciates, the PPP is supported, and when it depreciates, the validity of the PPP is not strong. Plošinjak and Festić (2021) examined the practical fitting of the PPP theory in Slovenia, Croatia, the Czech Republic, Slovakia, and Austria, and showed mixed support.

Figure 1 shows the yen-dollar exchange rate movement from 1990Q1. The data are the International Financial Statistics (IFS) of the IMF. As seen in Figure 1, exchange rate fluctuation is quite large and economic conditions have changed economies and made exchange rates fluctuate. Also, previous research tells us that whether the PPP theory holds or not is uncertain. At this stage, it can only be said that different conclusions will be drawn as to whether the PPP theory is established not only by statistical methods, but also by the target period and the target exchange rate.

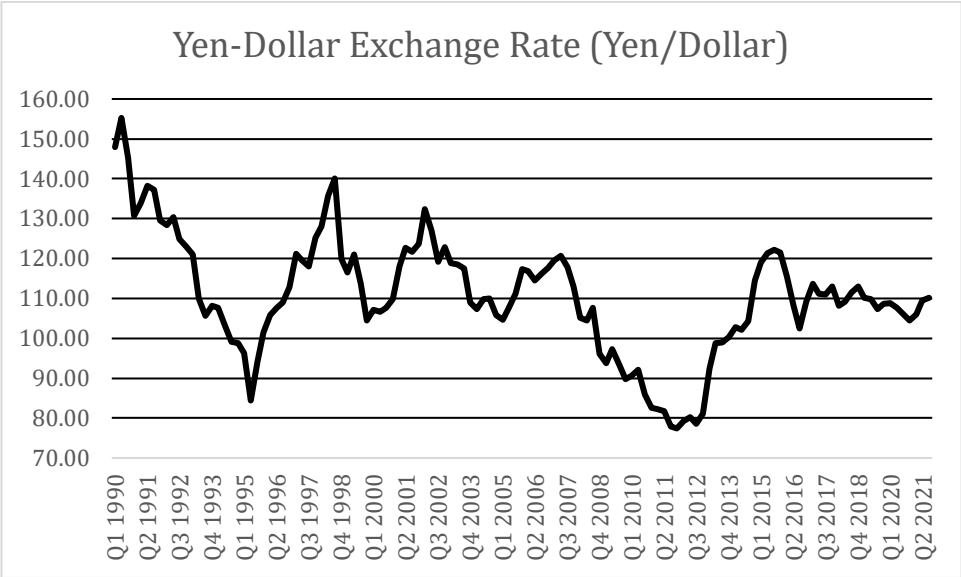


Figure 1: Yen-dollar exchange rate.

3. Empirical methods

This study employs the PPP for exchange rate determination. It may indeed be problematic to adopt only the PPP theory as the theory of exchange rate determination. For example, Kim and Park (2020) used the US related panel data, examined several elements using principal component analysis, and showed that these elements were significant. However, it would be a good idea to leave out interest rates when considering the medium- to long-term horizons covered in this study. In addition to interest rates, the money stock, income, and current account balance have also had an impact on the exchange rate at times. However, it can be said that there is no fixed theory. This paper proposes a new theory. The exchange rate is determined by the difference between the past exchange rate and the current exchange rate, and the difference between the exchange rate derived from the PPP theory and the current exchange rate. The first one can be called the Chartist model and the second one can be called the PPP model. Moreover, this study hypothesizes that when the deviations become large, there will be movement to correct the deviation.

The basic equation is as follows (1):

$$\textit{Exchange rate} = a + b1[\textit{exchange rate} - \textit{exchange rate}(-1)] + b2[\textit{PPP exchange rate} - \textit{exchange rate}] \quad (1)$$

In the regression, along with Ordinary Least Squares (OLS), other regression methods are used for estimation. The PPP exchange rate is calculated by Japanese price/US price. Prices are calculated by the average price of import

prices and export prices. Consumer prices are not used as exchange rates are related strongly to international trade. The sample period is from 1991Q1 to 2020Q4. This seems dated. One reason is a lack of data availability and the other reason is that COVID-19 has damaged international trade, and this might have an impact on exchange rates which are different from other periods. The impact of COVID-19 on exchange rates should be eliminated. All of the data are from the IFS.

4. Empirical results

This study hypothesizes that exchange rates are determined by the difference between the past exchange rate and the current exchange rate (Chartist model), and the difference between the exchange rate derived from the PPP theory and the current exchange rate (the PPP model). However, interest rates should be checked to examine whether or not they influence exchange rates in spite of the fact that this study uses quarterly data. The estimated equation is (2):

Exchange rate = a + b1[exchange rate – exchange rate(-1)] + b2[PPP exchange rate – exchange rate] + b3[Japanese interest rate – US interest rate] (2)

Interest rates are the money market rate (short-term) and the data are from the IFS. The regression result of equation (2) is in Table 1.

Table 1: Exchange rate determination using equation (2).

	Coefficient	t-Statistic	Prob.
C	120.391	27.815	0.000
exchange rate – exchange rate(-1)	0.435	1.759	0.008
PPP exchange rate – exchange rate	-0.342	-3.204	0.002
Japanese interest rate – US interest rate	-0.687	-1.237	0.219
Adj.R2	0.105	Akaike info criterion	8.004
F-Statistic (prob.)	5.632 (0.001)	Durbin-Watson stat.	0.088

Interest rate difference is insignificant at the 10% level. There is a high possibility that equation (2) is not used in short-term data. To check this, the exchange rate is regressed by equation (3). As an explanation variable, only interest rate difference is used for estimation. The sample period is from 1995 (not from 1991) and daily data are used for estimations due to the data availability. The data are from NIKKEI Telecom (Japanese newspaper company).

Exchange rate = a + b[Japanese interest rate – US interest rate] (3)

Table 2: Short-term exchange rate determination by the equation (3).

	Coefficient	t-Statistic	Prob.
C	101.768	473.111	0.000
Japanese interest rate – US interest rate	-2.806	-39.932	0.000
Adj.R2	0.201	Akaike info criterion	7.781
F-Statistic (prob.)	0.000	Durbin-Watson stat.	0.005

Interest rate difference is significant and it has impacts on exchange rate. However, this study focuses on medium- or long-term instead of short-term exchange rate determination. So, interest rate is omitted in the following analyses.

To examine the exchange rate determination in the medium-and long-term, equation (1) is regressed. Along with OLS, the other three statistical methods are employed for estimation. The results of the regression are shown in Table 3.

Table 3: Exchange rate determination using equation (1).

	Coefficient	t-Statistic/Z-Statistic	Prob.
OLS			
C	122.650	3.933	0.000
exchange rate – exchange rate(-1)	0.475	1.938	0.056
PPP exchange rate – exchange rate	-0.369	-3.507	0.000
Adj.R2	0.101	Akaike info criterion	8.000
F-Statistic (prob.)	7.649	Durbin-Watson stat.	0.086
ARCH			
C	120.033	77.708	0.000
exchange rate – exchange rate(-1)	0.517	3.997	0.000
PPP exchange rate – exchange rate	-0.192	-5.027	0.000
RESID(-1)^2	0.795	2.324	0.020
GARCH(-1)	0.258	1.622	0.105
Adj.R2	0.022	Schwarz Criterion	7.344
Akaike info criterion	7.205	Durbin-Watson stat.	0.077
Censored Normal (TOBIT)			
C	122.650	3.884	0.000
exchange rate – exchange rate(-1)	0.475	1.962	0.050
PPP exchange rate – exchange rate	-0.369	-3.550	0.000
SCALE:C(4)	12.886	15.491	0.000
Akaike info criterion	8.017	Schwarz Criterion	8.110
GLM			
C	122.650	31.184	0.000
exchange rate – exchange rate(-1)	0.475	1.938	0.053
PPP exchange rate – exchange rate	-0.367	-3.506	0.000
LR statistic (prob)	15.297 (0.000)	Schwarz Criterion	8.070
Akaike info criterion	8.000	Pearson statistic	170.301
Robust Least Squares			
C	125.725	30.983	0.000
exchange rate – exchange rate(-1)	0.470	1.888	0.059
PPP exchange rate – exchange rate	-0.359	-3.365	0.000
Rw-squared	0.146	Akaike info criterion	143.453
Rn-squared-statistic (prob)	14.191 (0.000)	Schwarz Criterion	152.034

Almost all of the results are robust. It should be noted that the coefficient of (the PPP exchange rate – exchange rate) is below zero as expected. It can be seen that when the exchange rate which is calculated based on the purchasing power parity theory deviates from the actual exchange rate, the actual exchange rate moves to correct it. Although the deviation from the past (one period ago) exchange rate had a positive effect, it was sometimes insignificant at the 5% level. Markets may refer to past exchange rates while taking into account factors that affect exchange rates at times.

Is not the impact on the actual exchange rate different depending on whether the discrepancy between the exchange rate calculated based on the purchasing power parity theory and the actual exchange rate is large or small? The estimations are cases when deviation was less than 10 yen per dollar and more than 50 yen per dollar. The regression methods are OLS. The results are shown in Table 4.

Table 4: Exchange rate determination when the discrepancy is small and large.

	Coefficient	t-Statistic	Prob.
10 Yen/Dollar			
C	148.364	60.971	0.000
exchange rate – exchange rate(-1)	0.219	1.025	0.412
PPP exchange rate – exchange rate	-1.419	-4.174	0.053
Adj.R2	0.837	Akaike info criterion	5.869
F-Statistic (prob.)	11.276 (0.081)	Durbin-Watson stat.	2.466
50 Yen/Dollar			
C	28.680	3.024	0.006
exchange rate – exchange rate(-1)	-0.147	-1.048	0.305
PPP exchange rate – exchange rate	1.559	8.698	0.000
Adj.R2	0.762	Akaike info criterion	4.734
F-Statistic (prob.)	44.330 (0.000)	Durbin-Watson stat.	0.166

It should be noted that the signs of the two explanatory variables are reversed. When the exchange rate deviates greatly from the one which is from the purchasing power parity, exchange rates may deviate further from levels considered reasonable. However, in this case, the market perceives that the exchange rate will move in the opposite direction from past exchange rates. On the other hand, if the deviation from the purchasing power parity theory is small, there will be moves to correct it.

Finally, impulse responses using two variables, namely, exchange rate change and (PPP exchange rate – exchange rate) change, are calculated. The results of the Vector Autoregression Estimates (VAE) are in Table 5. and Figure 2.

Table 5: VAE of exchange rate change and the PPP exchange rate – exchange rate.

	exchange rate – exchange rate(-1)	PPP exchange rate – exchange rate
exchange rate – exchange rate(-1)	0.932	-0.002
	(28.119)	(-0.156)
PPP exchange rate – exchange rate(-1)	0.013	0.978
	(0.347)	(68.938)
C	6.841	1.370
	(1.595)	(0.870)
Adj.R2	0.877	0.977
F-Statistic	434.765	2636.762
Akaike info criterion	5.988	3.982
Schwarz criterion	6.057	4.050

Note: Parentheses are t-statistic.

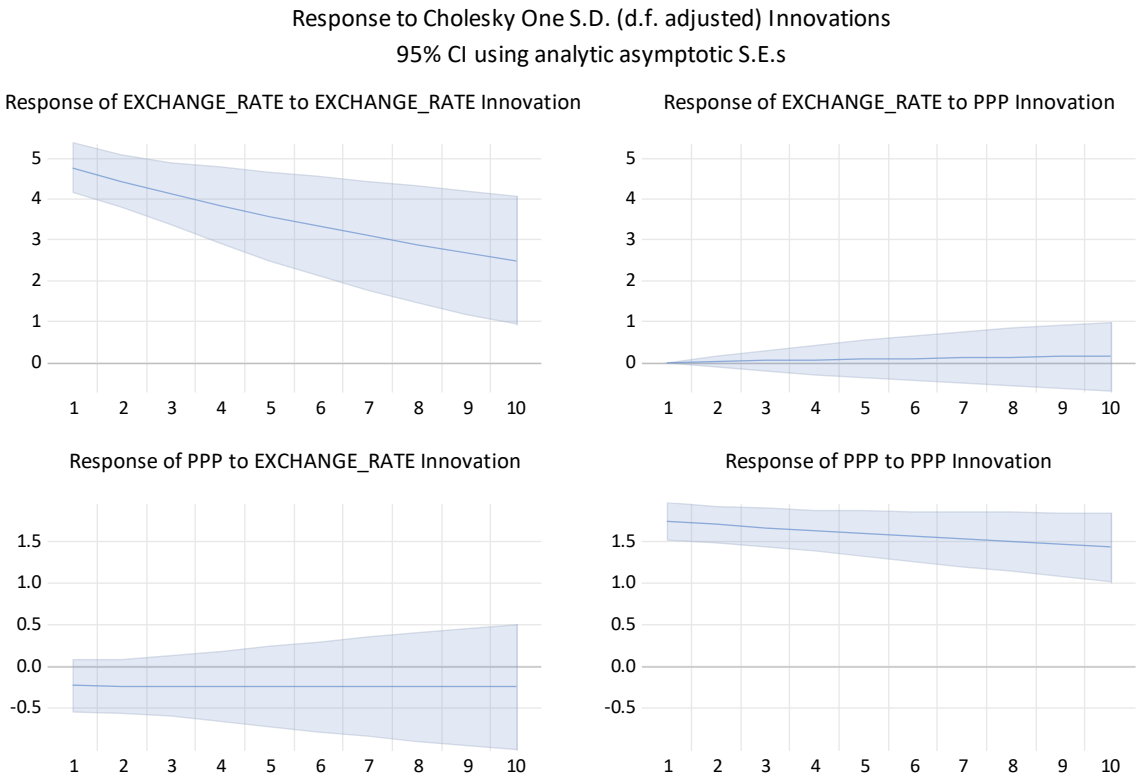


Figure 2: Impulse response

It should be taken into account that the shock of the two differences continue and expand. As seen in this mixture model, exchange rates may deviate further from levels considered reasonable.

5. Conclusion

In the medium- and long-term, prices instead of interest rates have an impact on exchange rates, and the PPP theory, which hypothesizes prices as a determining element in exchange rates, has been used in many fields. This study considers that exchange rates are determined by a combination of two models: the chartist model and the PPP model. On the other hand, it is often pointed out that the actual exchange rate deviates significantly from the exchange rate derived from the PPP theory. This study hypothesizes that when the deviation becomes large, there will be a movement to correct the deviation. The empirical estimations confirmed these phenomena, however, when the deviation is quite large, such movement cannot be found. There is a possibility that exchange rate movement may deviate further from levels considered reasonable.

Author Contributions: All authors contributed to this research.

Funding: Not applicable.

Conflict of Interest: The authors declare no conflict of interest.

Informed Consent Statement/Ethics Approval: Not applicable.

References

Anjaly, B., & Malabika, D. (2021). Central Bank Intervention and Monetary Approach of exchange rates: An evidence from India. Finance India, 35(3), 821-832.

Bahmani-Oskooee, M., Chang, T., & Lin, W.-C. (2014). Revisiting PPP in 34 OECD countries: sequential panel selection method. Applied Economics Letters, 21(18), 1283-1287. DOI: https://doi.org/10.1080/13504851.2014.923553

Chang, T. (2012). Nonlinear adjustment to PPP in China. Applied Economics Letters, 19(9), 843-848. DOI: https://doi.org/10.1080/13504851.2011.607111

Edison, H. J. (1987). PPP in the Long Run: A Test of the Dollar/Pound Exchange Rate (1890-1978). Journal of Money, Credit & Banking, 19(3), 376-387. DOI: https://doi.org/10.2307/1992083

Darné, O., & Hoarau, J.-F. (2008). The PPP in Australia: evidence from unit root test with structural break. Applied Economics Letters, 15(3), 203-206. DOI: https://doi.org/10.1080/13504850600721957

Gyamfi, E. N., & Appiah, E. F. (2019). Further evidence on the validity of PPP in selected African countries. Journal of Economics & Finance, 43(2), 330-343. DOI: https://doi.org/10.1007/s12197-018-9449-7

Kanas, A. (2006). PPP and Markov Regime Switching. Journal of Money, Credit & Banking, 38(6), 1669-1687. DOI: https://doi.org/10.1353/mcb.2006.0083

Kim, Y. (1990). PPP in the Long Run: A Cointegration Approach. Journal of Money, Credit & Banking, 22(4), 491-503. Doi: DOI: https://doi.org/10.2307/1992433

Kim, Y., & Park, C. (2020). Are exchange rates disconnected from macroeconomic variables? Evidence from the factor approach. Empirical Economies, 58(4), 1713-1747. DOI: https://doi.org/10.1007/s00181-018-1596-3

Kumar, N. P. (2005). New evidence on PPP from 17 OECD countries. Applied Economics, 37(9), 1063-1071. DOI: https://doi.org/10.1080/00036840500081713

Liu, Y.-S., Su, C.-W., & Zhu, M.-N. (2011). PPP with threshold effects for Central and Eastern European countries. Applied Economic Letters, 18(18), 1801-1806. DOI: https://doi.org/10.1080/13504851.2011.564121

Narayan, P., & Narayan, S. (2007). Are real exchange rates nonlinear with a unit root? Evidence on PPP for Italy: a note. Applied Economics, 39(19), 2483-2488. DOI: https://doi.org/10.1080/00036840600606369

Papell, D. H. (2006). The Panel PPP Puzzle. Journal of Money, Credit & Banking, 38(2), 447-467. DOI: https://doi.org/10.1353/mcb.2006.0035

Plošinjak, J., & Festić, M. (2021). Empirical Testing of PPP Validity in Selected European Union Countries. Our Economy, 67(4), 13-32. DOI: https://doi.org/10.2478/ngoe-2021-0019

Sarantis, N., & Stewart, C. (1993). Seasonality, cointegration and the long-run PPP: evidence for sterling exchange rates. Applied Economics, 25(2), 243-250. DOI: https://doi.org/10.1080/00036849300000030

She, F., Zakaria, M., Khan, M., & Wen, J. (2021). PPP in Pakistan: Evidence from Fourier Unit Root Tests. Emerging Markets Finance & Trade, 57(13), 3835-3854. DOI: https://doi.org/10.1080/1540496X.2019.1709820

Tajdini, S., Mehrara, M., & Taiebnia, A. (2023). Investigating the fluctuations of exchange rate based on monetary-behaviour approach. International Journal of Finance & Economics, 28(2), 1242-1249. DOI: https://doi.org/10.1002/ijfe.2473

Uğur, M. S., & Alper, A. E. (2023). Revisiting PPP in OECD Countries: New Evidence from Nonlinear Unit Root Test with Structural Breaks. Sosyoekonomi, 31, 25-45. DOI: https://doi.org/10.17233/sosyoekonomi.2023.03.02

Wan, K.-H., Su, C.-W., Tao, R., & Xiong, D.-P. (2019). Does the PPP fit for China? Economic Research-Ekonomska Istrazivanja, 32(1), 2028-2043. DOI: https://doi.org/10.1080/1331677X.2019.1637763

Yilanci, V., Aslan, M., & Özgür, Ö. (2018). Testing the validity of PPP theory for African countries. Applied Economics Letters, 25(18), 1273-1277. DOI: https://doi.org/10.1080/13504851.2017.1418066

Yun, T. (2017). Natural Exchange Rate and Its Implications for the PPP Puzzle. Emerging Markets Finance & Trade, 53(11), 2397-2418. DOI: https://doi.org/10.1080/1540496X.2017.1326381

Zhang, Z., Bian, Z., & Zhan, M. (2022). Is absolute PPP special for Spain? Empirical Economics, 32(2), 513-531. DOI: https://doi.org/10.1007/s00181-021-02038-y

The Asian Institute of Research
Economics and Business Quarterly Reviews
Vol.7, No.1, 2024: 160-180
ISSN 2775-9237

DOI: 10.31014/aior.1992.07.01.567

Research on Factors Affecting the Intentions to Invest in Stocks of Vietnamese Youth

Hoang Thanh Tung[1], Do Duong Minh Triet[1]

[1] University of Labor and Social Affairs. Email: hoangthanhtung15@gmail.com
[2] Saigon South International School. Email: jennybenz72@gmail.com

Abstract
To study the factors affecting the stock investment intention of Vietnamese youth, the research team used quantitative research methods based on sample data collected from a survey of 482 young people, of which 262 were young people who have made stock investments and intend to invest in stocks. The research team used SMARTPLS software to process collected survey data. Research results show that, in 6 factors with 95% confidence, 4 factors have an impact on the stock investment decisions of young people living in Vietnam. Among them, "Subjective Norms" (CCQ) has the strongest influence on stock investment intention with an influence of 0.349; Next is the factor "Perceived behavioral control" (NTKS) with an influence level of 0.181; The factor "Attitude towards money" (TDTB) has an influence level of 0.175; The factor "Attitude towards stock investment" (TDCK) has an influence level of 0.166. Two factors "Risk Perception" and "Profitability and stability" are not statistically significant enough to show a relationship with the stock investment intentions of young people living in Vietnam. Based on the analysis results, the research team proposed several discussions to promote young people's readiness and improve awareness and ability to carry out investment activities and stock investments.

Keywords: Influencing Factors, Investment, Stock Investment, Stock Investment Intention, Young People, Vietnam

1. Raising the issues

The fact that many investors under 26 years old are entering the stock market is not a surprising phenomenon given the stock fever that has lasted from mid-2020 to the present. Data from the Vietnam Securities Depository Center (VSD) shows that the number of new individual accounts opened in November 2021 exceeded the 200,000 mark for the first time and increased by more than 70% compared to the previous month. Many securities companies, seeing great potential from the new generation of investors, have also increased marketing campaigns and launched account packages specifically for Gen Z. From a demographic group associated with stereotypes of "playing around," "spending money," "frivolous"... Gen Z is gradually "breaking the ice," appearing on the stock market as a group of potential investors. Gen Y - the Millennials generation (born from 1986-1991) was born in a period of turmoil, especially the Great Recession of 2008, which shaped a pessimistic mindset and created an obstacle mentality that made this group less accessible. with investment. Meanwhile, growing up in the digital age with a dynamic socio-economic situation makes Gen Z more investment-conscious. Research by the financial

platform SingSaver in September 2020 in Singapore showed that 85% of Gen Z respondents started saving money before the age of 22, more than double that of Millennials (only 41%) (vnexpress.net, 2021).

Stocks are a risky investment channel but also promise high profits. For many young people, stocks have become a second income channel with compound interest rates of up to 10% per year. Stock investment is an inevitable trend for Gen Z today. Even though there are risks, buying and selling stocks on the stock market is still an attractive profit channel. Stocks are very suitable for the young generation who like to take risks. In particular, with the advantage of unlimited capital, stocks are an ideal choice for young people who do not have much-accumulated capital (Hanh, N., 2024).

In this study, the research team reviewed and established a model of factors affecting young people's stock investment intention, then tested the influence of these factors on the stock investment intention of Vietnamese youth using software SMARTPLS. The research results will be the basis for proposing some measures to encourage young people to participate in stock investment and improve knowledge and efficiency of investment activities in general and stock investment of young people in particular.

2. Theoretical basis, overview, model, and research hypotheses

2.1. Theoretical basis

2.1.1. Stock investment

Stock investment is investing in products on the stock market, specifically stocks, bonds, open funds... In the simplest terms, when you invest in stocks, you buy these products at a low price and resell them at a high price, thereby receiving a profit on investment (Prudential.com.vn, n.d).

The stock market works by allowing investors to buy and sell stocks that are listed on exchanges, through online and licensed brokers. Thus, if you want to invest in stocks, you first need to find a licensed broker (Prudential.com.vn, n.d).

According to Clause 15, Article 4 Securities Law 2019 Regulations: Securities investment is the buying, selling, and holding of securities by investors on the stock market.

Clause 1 Article 4 Securities Law 2019 regulations that securities are assets, including the following types of securities: Stocks, bonds, fund certificates; Warrants, covered warrants, share purchase rights, and depository certificates; Derivative securities; Other types of securities are regulated by the Government.

2.1.2. Theory of Reasoned Action - TRA (Theory of Reasoned Action)

Fishbein and Ajzen (1975) proposed a rational behavior model (TRA) that explains and predicts behavioral intentions in cases of product adoption. This theory states that “intention” is the best predictor of final behavior and that intention is simultaneously determined by attitudes and subjective norms.

2.1.3. Theory of Planned Behavior – TPB (Theory of Planned Behavior)

TPB's theory Ajzen (1991) posits that people perform a certain behavior if they believe that this behavior will bring about valuable outcomes. TPB theory includes a set of relationships between attitudes, subjective norms, perceived control, and behavioral intentions.

(1) Attitude: This is an emotional state that represents an individual's behavior through gestures, speech, facial expressions, expressions, images, and things related to the product.

(2) Subjective norms. Behavioral intention is influenced by the attitudes of stakeholders toward using the product, and the motivation of people to use the product is influenced by the behaviors and desires of stakeholders.

(3) Perceived behavioral control. Is an individual's perception of how easy or difficult it is to perform the behavior (related to the availability of necessary resources, knowledge, and opportunities to apply)

2.1.4. Behavioral finance theory

Fernandes et al. (2007) divided behavioral biases into two groups: cognitive biases and emotional biases, although both types lead to irrational decisions. Because cognitive biases (heuristics) such as decision anchoring, availability, and typical situations stem from inaccurate reasoning, better information and advice can often correct them. In contrast, emotional tendencies, such as regret and risk aversion, stem from impulsive feelings or intuition, rather than from conscious reasoning, and are difficult to correct.

Cognitive bias (heuristics) refers to the rules of thumb that people use to make decisions in complex, uncertain environments. Emotional tendencies that can impact decision-making are conveniently grouped under prospect theory. Kahneman & Tversky (1979). This theory provides a descriptive framework for how people make decisions under conditions of risk and uncertainty and includes a richer behavioral framework than the subjective expected utility theory under many economic models (Masomi & Ghayekhloo, 2011).

Camerer and Loewenstein (2004) point out 4 psychological factors that affect individual investors' investment decisions, including (i) *Too confident mentality*: Investors believe they are equipped with more knowledge than other investors (Shiller, 2015); (ii) *Herd mentality:* Investors will follow the market trend. Therefore, instead of using the information they find to make decisions, they tend to listen to other investors; (iii) *Confidence:* Investors have an optimistic view that the financial market will develop and prices will continue to increase; (iv) *Fear of risks and reckless psychology:* The first important finding of Prospect Theory is that when faced with the prospect of a certain benefit, people tend to fear risk, but will tend to be reckless if faced with a loss. (Kahneman & Tversky, 1979).

2.2. Research overview

Many empirical studies apply behavioral theory and/or behavioral finance theory to study factors affecting investment intentions and stock investments of individuals or organizations/businesses.

Table 1: Overview of studies on factors affecting investment intention/decision and stock investment

	Toan, P.N & Long, N.T (2018)	Ha, P.V & associates (2022)	Hue, T.H.T (2019)	Toan, N.D & associates (2022)	Abul, S.J (2019)	Tung, H.T & Nguyen, H.C (2023)	Hieu, V. T, & et al (2020)
Quality of financial reporting information	+						
Company's face	+						
Opinions of consultants	+						
Crowd mentality	+		+		+		+
Overconfidence	+		+		+		+
Profitability and stability		+				+	
Growth potential		+					
Behavioral finance		+					

Market psychology		+					
Macro factors		+					
Excessive optimism			+		+		
Representative			+				
Neo decided			+				+
Bi quan			+				
Impact of the Covid-19 pandemic				+			
Tendency to take risks				+			
Attitude toward stock investment				+		+	
Financial capacity				+			
Subjective standards				+		+	
Financial knowledge/Perceived behavioral control				-		+	
Risk psychology					+	+	
Attitude towards money						+	
Available trends							+
Typical situation							+

(+) Impact in the same direction; (-) Opposite effect

Source: Compiled by the research team

2.3. Model, scale, and research hypothesis

Based on theory and research overview, the research team proposed a model of factors affecting the stock investment intention of Vietnamese youth in Figure 1.

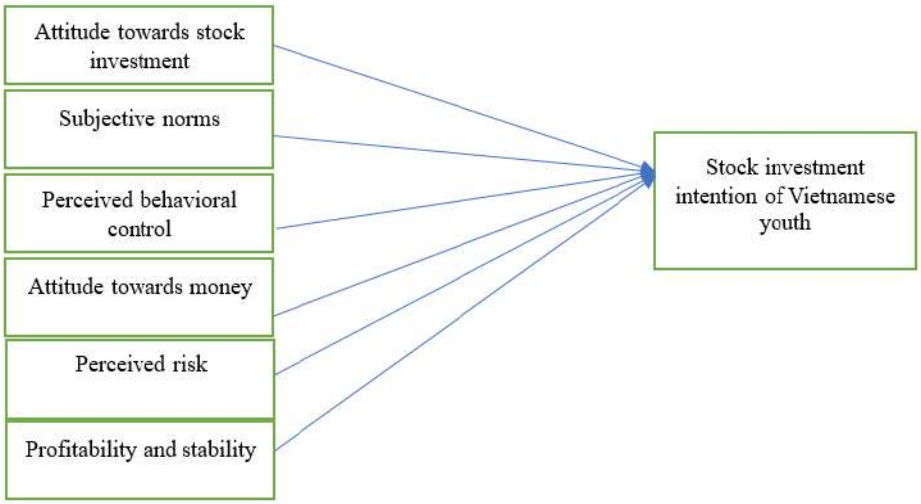


Figure 1: Proposed research model

Source: Research team's proposal

Research hypothesis:

Hypothesis H1: Attitude towards stock investment (TDCK) has a positively correlated impact on the intention to invest in stocks of Vietnamese youth (YDDTCK)
Hypothesis H2: Subjective norms (CCQ) have a positively correlated impact on Vietnamese youth's intention to invest in stocks (YDDTCK)
Hypothesis H3: Perceived behavioral control (NTKS) has a positively correlated impact on Vietnamese youth's stock investment intention (YDDTCK)
Hypothesis H4: Attitude towards money (TDTB) has a positively correlated impact on the stock investment intention of Vietnamese youth (YDDTCK)
Hypothesis H5: Perceived risk (CNRR) has a negative correlation effect on the stock investment intention of Vietnamese youth (YDDTCK)
Hypothesis H6: Profitability and stability (KNSL) have a positively correlated impact on the stock investment intention of Vietnamese youth (YDDTCK)

Table 1: Basis for forming variables and factor scales in the model

STT	**Encode**	**Observed variables**	**References**
I	**TDCK**	Attitude toward stock investment	Toan, N.D & colleagues (2022); Linán & Chen (2009); Tuan, N.A (2018); Tung, H.T & Nguyen, H.C (2023)
1	TDCK1	I feel excited when deciding to invest in stocks	
2	TDCK2	I feel that investing in stocks is an activity that brings many benefits	
3	TDCK3	I feel investing in stocks is a good thing to do	
4	TDCK4	Becoming a stock investor is your passion and career direction	
II	**CCQ**	**Subjective Norms**	Toan, N.D & colleagues (2022); Linán & Chen (2009); Tuan, N.A (2018); Krueger (2000);
5	CCQ1	Your family supports your stock investment decision	

6	CCQ2	Your friends will support your stock investment decision	Huong, T.H.D & colleagues (2021); Nasurdin & et al (2009); Thuong, H.T (2014); Duyen, T.T.K (2022); Tung, H.T & Nguyen, H.C (2023)
7	CCQ3	You know many people who have successfully invested in stocks	
8	CCQ4	Everyone advises you to become a stock investor	
9	CCQ5	If you invest in stocks, you will receive many incentives and support from the security company	
III	**NTKS**	**Perceived behavioral control**	Huong, T.H.D & colleagues (2021); Linán & Chen (2009); Tuan, N.A (2018); Toan, H.K, et al (2021);Tung, H.T & Nguyen, H.C (2023)
10	NTKS1	I have the ability to invest in stocks	
11	NTKS2	I am willing to spend time and money to invest in stocks	
12	NTKS3	I can easily access information, and easily participate in stock investment courses	
13	NTKS4	Everyone has the ability to invest in stocks	
IV	**TDTB**	**Attitude towards money**	Schwarz et al (2009); Tuan, N.A (2018); Tung, H.T & Nguyen, H.C (2023)
14	TDTB1	High income is an important criterion in assessing individual success	
15	TDTB2	Making a lot of money is important to you	
16	TDTB3	Money is an important measure of personal ability	
IN	**CNRR**	**Perceived risk**	Abul, S.J (2019); Tung, H.T & Nguyen, H.C (2023)
17	CNRR1	Investing in stocks can bring many risks	
18	CNRR2	Investing in stocks requires large capital resources	
19	CNRR3	The stock investment environment has many unfair competitors	
20	CNRR4	Young people may face legal difficulties when participating in the stock market	
WE	**KNSL**	**Profitability and stability**	Ha, P.V & associates (2022); Tung, H.T & Nguyen, H.C (2023)
21	KNSL1	The stock investment environment in Vietnam is reputable	
22	KNSL2	The stock investment environment has many favorable conditions	
23	KNSL3	Fair stock investment environment	

24	KNSL4	The stock investment environment is stable	
25	KNSL5	The stock investment environment has the ability to generate high profits	
VII	**YDTCK**	**Intention to invest in stocks**	Lau, V.P., et al; Lien, D.T.H (2022); Tung, H.T & Nguyen, H.C (2023)
26	YDDTCK 1	Investing in stocks in the near future is an idea I am thinking about	
27	YDDTCK 2	I will spend time and resources to learn about stock investment activities	
28	YDDTCK 3	Making stock investments is one of my priorities in the near future	
29	YDT4	I will encourage my friends to also carry out stock investment activities	

Source: Compiled and proposed by the research team

3. Research methods

3.1. The method of data collection

Based on theory and an overview of research on factors affecting investment intentions and stock investment of Vietnamese youth, factors included in the research model include 6 independent variables: *(i) Attitude towards securities investment (TDCK); (ii) Subjective norms (CCQ); (iii) Perceived behavioral control (NTKS); (iv) Attitude towards money (TDTB); (v) Perceived risk (CNRR); (vi) Profitability and stability (KNSL);* The effect on the dependent variable is *"Vietnamese youth's stock investment intention" (YDDTCK).*

The survey was built with a 5-point Likert scale, with:

1. Completely disagree
2. Disagree
3. Normal
4. Agree
5. Completely agree

Quantitative research methods were conducted to collect young people's opinions on factors affecting stock investment intentions.

After developing the survey questionnaire, the research team conducted a random pilot survey of 9 young people who carry out investment activities and stock investments. Preliminary survey results show that opinions agree with the factors included in the model.

Due to limited time and resources for the survey, the author used a convenience sampling method. The sample size was determined according to the rules of Comrey and Lee (1992), Also refer to the rules by Hoang Trong & Chu Nguyen Mong Ngoc (2005). With 29 parameters (observed variables) needed to conduct factor analysis, the minimum number of samples needed is 29 x 5 = 145 observed samples; The surveyed subjects were Vietnamese young people (young people under 30 years old). From the perspective of collecting as many observation samples as possible to ensure the stability of the impact, based on the ability to collect samples, the research team decided to choose the number of observation samples as n = 500. To ensure sample size: The author distributed 500 survey questionnaires delivered to the survey subjects by online submission via the link (https://docs.google.com/forms/d/e/1FAIpQLSeuwdLi9q6uU6RJhYq2fOrLu3BUCid8BhpaE_CIVcM-

V0iAcA/viewform) combined with distributing questionnaires directly to survey subjects. The ballots collected were 489, in which, there were 482 valid votes included in the analysis. Of the 482 surveys returned, 262 people (guaranteed to be greater than 145) have invested in stocks and intend to invest in stocks and were included in the analysis of the influence of factors on stock investment intentions. of Vietnamese young people.

3.2. Data processing method

A quantitative research method was conducted to process research data collected from a survey of people in Vietnam (people under 30 years old). The structural regression equation has the general form:

YDDTCK = a*TDCK + b*CCQ+c*NTKS+d*TDTB-e*CNRR+f*KNSL

SMARTPLS software is used to test hypotheses and evaluate the impact of factors.

Step 1: Evaluating Measurement Model

Evaluating measurement model based on examining values of reliability, quality of observed variable, convergence, and discriminant

- Testing the quality of observed variables (Outer Loadings)

Outer Loadings of observed variables are indicators showing the degree of association between observed variables and latent variables (proxy variables). Outer loadings in SMART PLS are the square root of the absolute value of R2 linear regression from the latent variables to the sub-observed variables.

Hair et al. (2016) suggest that the outer loadings should be greater than or equal to 0.708 observed variables that are quality. To make it easier to remember, the researchers rounded off the threshold to 0.7 instead of the number 0.708.

- Evaluating Reliability

Evaluating the reliability through SMARTPLS by two main indicators, Cronbach's Alpha and Composite Reliability (CR). Composite Reliability (CR) is preferred by many researchers over Cronbach's Alpha because Cronbach's Alpha underestimates the reliability compared with CR. Chin (1988) claims that in exploratory research CR must be over 0.6. For confirmed studies, the 0.7 threshold is the appropriate level of CR (Henseler & Sarstedt, 2013). Other researchers agree that 0.7 is the appropriate threshold for the vast majority of cases such as Hair et al. (2010), and Bagozzi & Yi (1988).

Thus, the reliability through SMARTPLS is shown by Cronbach's Alpha ≥ 0.7 (DeVellis, 2012); and Composite Reliability CR ≥ 0.7 (Bagozzi& Yi, 1988).

- Testing Convergence

Evaluating Convergence on SMARTPLS is based on Ave (Average Variance Extracted). Hock & Ringle (2010) claim that a scale reaches a convergence value if AVE reaches 0.5 or higher. This level of 0.5 (50%) means that the average latent variable will explain at least 50% of the variation of each sub-observed variable. Thus, convergence is evaluated by Average Variance Extracted AVE ≥ 0.5 (Hock & Ringle, 2010).

- Testing Discriminant Validity

Discriminant value is used to consider whether a research variable is different from other research variables in the model. To evaluate the discriminant validity, Sarstedt & et al. (2014) said that considering two criteria including cross-loadings and the measurement of Fornell and Larcker (1981).

Cross-loading coefficients are often the first approach to evaluating the discriminant validity of indicators (observed variables) (Hair, Hult, et al., 2017). The load factor of the observed variable (indicator) linked in the factor (latent variable) should be greater than any of its cross-load factors (its correlation) in the other factors.

Fornell and Larcker (1981) recommend that discrimination is ensured when the square root of AVE for each latent variable is higher than all correlations between latent variables. In addition, Henseler & et al. (2015) used simulation studies to demonstrate that discriminant validity is better evaluated by the HTMT index that they developed.

With the HTMT index, Garson (2016) said that the discriminant validity between two latent variables is guaranteed when the HTMT index is less than 1. Henseler & et al. (2015) propose that if this value is below 0.9, the discriminant validity will be guaranteed. Meanwhile, Clark & Watson (1995) and Kline (2015) used a stricter standard threshold of 0.85. SMARTPLS preferred a threshold of 0.85 in the evaluation.

- Testing Multicollinearity

In this study, the author uses a scale related to multicollinearity as a variance magnification factor (VIF). Very high levels of multicollinearity are indicated by VIF values >= 5; the model does not have multicollinearity when VIF indicators < 5 (Hair et al., 2016).

Step 2: Evaluating Structural Model

After evaluating the satisfactory measurement model, evaluate the structural model through the impact relationship, path coefficient, R squared, and f squared.

- Evaluating impactful relationships

To evaluate impact relationships, use the results of Bootstrap analysis. Based mainly on two columns (1) Original Sample (normalized impact factor) and (2) P Values (sig value compared to 0.05 significance level).

- Original Sample: Standardized impact factor of the original data. SMARTPLS have no unstandardized impact factor.
- Sample Mean: The average standardized impact factor of all samples from Bootstrap.
- Standard Deviation: Standard deviation of the standardized impact factor (according to the original sample).
- T Statistics: Test value t (test student the meaning of the impact).
- P Values: The significance level of the T Statistics. This significance level is considered with comparative thresholds such as 0.05, 0.1, or 0.01 (usually used as 0.05).

Evaluating the level of interpretation of the independent variable for the dependent variable by R2 coefficient (R square). To evaluate the R2 coefficient, we will use the results of the PLS Algorithm analysis. The R2 value evaluates the predictive accuracy of the model and shows the level of interpretation of the independent variable for the dependent variable. R square is between 0 and 1, the closer to 1 indicates the more independent variables that account for the dependent variable (Hair, Hult, et al., 2017).

In addition, to evaluate the influence of each factor, the team determined the distance value and average value of each factor and determined which response threshold the average score falls within.

Distance value = (Maximum - Minimum) / n = (5-1)/5 = 0.8

Evaluation thresholds based on average score value:

+ 1.00 - 1.80: Strongly disagree
+ 1.81 - 2.60: Disagree
+ 2.61 - 3.40: No opinion
+ 3.41 - 4.20: Agree
+ 4.21 - 5.00: Strongly agree

4. Research results

4.1. Descriptive statistics of survey participants

482 people were participating in the survey. Because the survey method is convenient and random, the results show that more women are interested and willing to answer the survey with 408 females (84%), 66 males (14%), and 8 people who did not want to specify (2%).

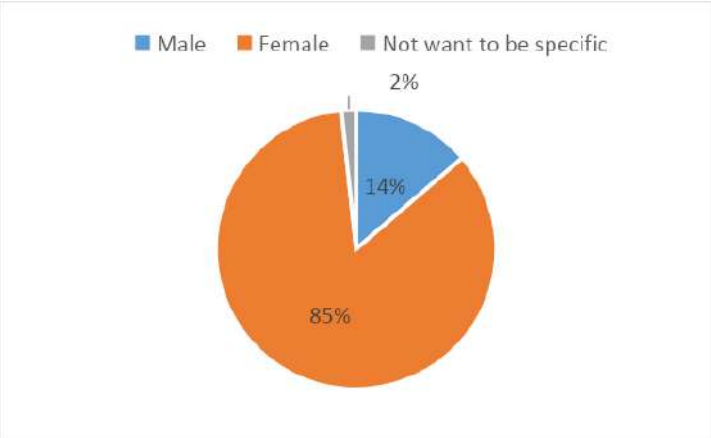


Figure 1: Gender of survey participants

Source: Survey results

Participating in the survey focused mainly on 434 people (90%) who are studying in college, 29 people (6%) are studying after college and 19 young people (4%) are high school students. The ages participating in the survey were mainly from 18-22 years old (88%), under 18 years old were 21 people (4%), 23-25 years old (5%), and from 26-30 years old were 16 people (3%). The research team pushed votes in all three regions of Vietnam, the North, Central, and South, the number of votes collected in the North was 274 votes (57%), the South 108 votes (22%), and the Central region 100 votes (20%).

4.2. General information about the stock investment situation of young people participating in the survey

Regarding whether they have ever invested in stocks, the results show that young people have participated in stock investments, accounting for a small percentage of only 29/482 people who have ever participated in stock investments (6%), the rest have never invested in stocks. Of the 29 people who have invested in stocks, 18 people intend to continue investing (62%), and 11 people will not continue to invest in the future (38%). But of the 453 people who have never invested in stocks, 244 people plan to invest in the future (54%), and 209 people who do not plan to invest (46%).

The reasons why people who have ever invested and those who have never invested in stocks do not want to invest in this channel, the survey results are recorded in Figure 2.

Figure 2: Reasons for not investing in the stock market

Source: Survey results

Likes a stable job, stable income 87/220 people; Investing in stocks is a risky business 79/220 people; Not enough resources to invest in stocks 58/220 people; Don't have much experience in investing in stocks 98/220 people; Simply do not like investing in stocks 58/220 people.

For those who have invested in stocks, the majority have invested for less than 1 year, accounting for 56%, for 1-5 years, accounting for 39%, and for over 5 years, only 5%.

The main investment channel is 62% stocks, 25% bonds, and 13% open funds. The main form is buying directly at the stock issuer or fund management company 83%, buying through online brokerage companies, such as SSI, Mitrade, VPS, etc. 17%, did not record the choice of buying channel through a stock broker.

The stock indexes recognized to have the interest of young people are the VN-Index; VN30-Index; VNXAllshare; HNX-Index; UPCOM, especially the VN-Index and VN30-Index.

4.3. Testing results

4.3.1. Results of assessing the quality of observed variables in the measurement model

4.3.1.1. Check the quality of observed variables

The quality of observed variables is assessed through the external loading factor (outer loadings). In the initial data, the CCQ5 scale had an outer loadings of $0.381 < 0.7$, so the CCQ5 scale was removed from the model. The research team ran the data again a second time. The quality of observed variables affecting the stock investment intentions of young people living in Vietnam is shown in Table 1.

Table 1: Outer loadings of influencing factors investment intention of young people living in Vietnam

	CCQ	CNRR	KNSL	NTKS	TDCK	TDTB	YDTCK
CCQ1	**0.840**						
CCQ2	**0.853**						
CCQ3	**0.777**						
CCQ4	**0.849**						
CNRR1		**0.841**					
CNRR2		**0.793**					
CNRR3		**0.822**					
CNRR4		**0.718**					
KNSL1			**0.846**				
KNSL2			**0.881**				
KNSL3			**0.840**				
KNSL4			**0.834**				
KNSL5			**0.752**				
NTKS1				**0.818**			
NTKS2				**0.864**			

NTKS3				**0.864**			
NTKS4				**0.757**			
TDCK2					**0.800**		
TDCK3					**0.870**		
TDCK4					**0.788**		
TDTB1						**0.852**	
TDTB2						**0.893**	
TDTB3						**0.804**	
YDDTCK 1							**0.865**
YDDTCK 2							**0.837**
YDDTCK 3							**0.902**
YDDTCK 4							**0.858**
TDCK1					**0.857**		

Source: Testing results of the research team

Results from Table 1 show the outer loadings of all the total variable correlation coefficients of the variables affecting the stock investment intention of young people living in Vietnam (all > 0.7) (Hair & et al., 2016) showing the observed variables are significant.

4.3.1.2. Test the reliability of the scale

Evaluate scale reliability of factors influencing stock investment intention of young people living in Vietnam by PLS-SEM through two main coefficients, Cronbach's Alpha and Composite Reliability (CR).

Table 2: Reliability coefficient (Cronbach's Alpha) and composite reliability of factors affecting stock investment intentions of young people living in Vietnam

	Cronbach's Alpha	**rho_A**	**Composite Reliability**	**Average Variance Extracted (AVE)**
CCQ	**0.850**	**0.851**	**0.899**	**0.690**
CNRR	**0.805**	**0.811**	**0.872**	**0.632**
KNSL	**0.888**	**0.892**	**0.918**	**0.692**
NTKS	**0.845**	**0.853**	**0.896**	**0.684**
TDCK	**0.849**	**0.857**	**0.898**	**0.688**

TDTB	**0.810**	**0.839**	**0.887**	**0.723**
YDTCK	**0.889**	**0.889**	**0.923**	**0.750**

Source: Testing results of the research team

According to Table 2, after analyzing and testing the reliability using Cronbach's Alpha coefficient of the factor, the results are: Subjective norms (CCQ) reached 0.850; Perceived risk (CNRR) reached 0.805; Profitability and stability (KNSL)reached 0.888; Perceived behavioral control (NTKS) reached 0.845; Stocks investment attitude (TDCK) reached 0.849; Attitude towards money (TDTB) reached 0.810; Intention to invest in securities (YDDTCK) reached 0.889. Thus, all scales satisfy the condition > 0.7 (DeVellis, 2012) and do not violate any rules for eliminating variables, so no variables are eliminated and are acceptable in terms of reliability.

The Composite Reliability (CR) of all observed variables is also > 0.7 (Bagozzi & Yi, 1988). Therefore, the scale is reliable, has analytical significance, and is used in subsequent factor analysis.

4.3.1.3. Convergence

According to the data analysis results in Table 2, the average variance extracted index AVE (Average Variance Extracted) of the factor: Subjective norms (CCQ) reached 0.690; Perceived risk (CNRR) reached 0.632; Profitability and stability (KNSL) reached 0.692; Perceived behavioral control (NTKS) reached 0.684; Stock investment attitude (TDCK) reached 0.688; Attitude towards money (TDTB) reached 0.723; Stock investment intention (YDDTCK) reached 0.750.

Thus, the average variance extracted index AVE (Average Variance Extracted) of all variables is > 0.5 (Hock & Ringle, 2010), which shows that the model satisfies the convergence conditions.

4.3.1.4. Discriminant Validity

Results in Table 3 regarding indicators Fornell-Larcker of the research model on factors affecting stock investment intentions of young people living in Vietnam shows the following factors: Subjective norms (CCQ); Perceived risk (CNRR); Profitability and stability (KNSL); Perceived behavioral control (NTKS); Attitude towards stocks investment (TDCK); Attitude towards money (TDTB); Intention to invest in stock (YDDTCK) ensures discrimination because all the AVE square root values on the diagonal are all higher than their off-diagonal values. Therefore, in terms of discriminant validity, the two criteria including the cross-loading coefficient and Fornell and Larcker's criterion have met the conditions.

Table 3: Fornell-Larcker criteria of research model about factors affecting stock investment intentions of young people living in Vietnam

	CCQ	**CNRR**	**KNSL**	**NTKS**	**TDCK**	**TDTB**	**YDTCK**
CCQ	0.831						
CNRR	0.423	0.795					
KNSL	0.387	0.195	0.832				
NTKS	0.668	0.451	0.271	0.827			
TDCK	0.661	0.456	0.306	0.713	0.829		
TDTB	0.446	0.702	0.263	0.410	0.424	0.850	

YDTCK	0.674	0.415	0.349	0.612	0.610	0.475	0.866

Source: Testing results of the research team

The test results in Table 4 give the HTMT index results in terms of discrimination between factors influencing the stock investment intention of young people living in Vietnam. Garson (2016) shows that the distinctiveness of the variables is guaranteed (because they are all <1), according to Henseler et al. (2015), if this value is below 0.9, discriminant validity is guaranteed. The HTMT value in Table 4 shows the discrimination of all factors included in the model.

Table 4: HTMT index of the research model of factors affecting stock investment intentions of young people living in Vietnam

	CCQ	**CNRR**	**KNSL**	**NTKS**	**TDCK**	**TDTB**	**YDTCK**
CCQ							
CNRR	**0.508**						
KNSL	**0.442**	**0.231**					
NTKS	**0.782**	**0.546**	**0.310**				
TDCK	**0.774**	**0.557**	**0.345**	**0.839**			
TDTB	**0.523**	0.873	**0.297**	**0.496**	**0.514**		
YDTCK	**0.774**	**0.484**	**0.391**	**0.704**	**0.692**	**0.548**	

Source: Testing results of the research team

4.3.1.5. Function value f^2

Function $\mathbf{f^2}$ value shows the influence of the structure (factor) when removed from the model. $\mathbf{f^2}$ values corresponding to 0.02, 0.15, and 0.35, respectively affect small, medium, and large (Cohen, 1988) exogenous variables. If the effect size < 0.02 then it seems like it doesn't affect.

Table 5: Summary table of f values[2]

	CCQ	**CNRR**	**KNSL**	**NTKS**	**TDCK**	**TDTB**	**YDTCK**
CCQ							0.118
CNRR							**0.001**
KNSL							**0.010**
NTKS							0.030
TDCK							0.025
TDTB							0.032
YDTCK							

Source: Testing results of the research team

In this model, in Table 5 we see that there are links between "Subjective norms" (CCQ) (0.118), "Attitude towards money" (TDTB) (0.032), "Perceived behavioral control" (NTKS) (0.030), "Attitude towards stock investment" (TDCK) (0.025), with $\mathbf{f^2} > 0.02$ is considered to have a small effect to "Intention to invest in stocks of young people living in Vietnam" (YDDTCK). In there, factor “Profitability and stability” (KNSL) (0.010), factor “Perceived risk” (CNRR) (0,001) with $\mathbf{f^2} < 0.02$ is considered to have no effect.

4.3.2. Results of assessing the level of influence using the structural model

4.3.2.1. Evaluate influence relationships

The relationship and level of influence of factors affecting stock investment intentions of young people living in Vietnam on SMARTPLS are shown in Figure 2.

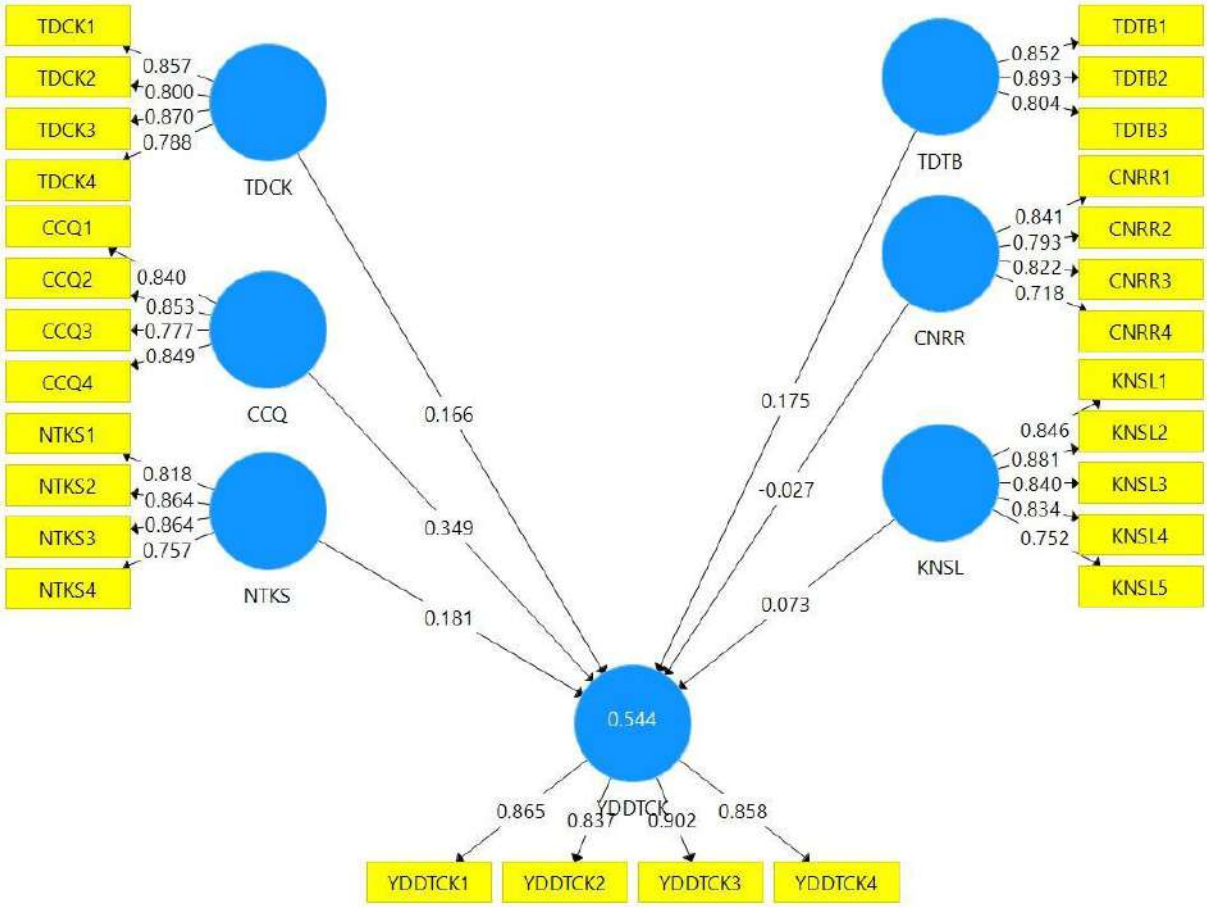


Figure 2: Factors affecting stock investment intentions of young people living in Vietnam

Source: Testing results using SMARTPLS by the research team

Results of Bootstrap analysis to evaluate influence relationships are shown in Table 6. Accordingly, 3 factors *"Profitability and stability," "Perceived behavioral control," "Attitude towards investment" with P - value < 0.05, and factor "Attitude towards money"* with a P - value <0.1, reflect that these factors are statistically significant enough to show a relationship that has a positive influence on the stock investment intention of young people living in Vietnam (*Hypotheses H1, H2, H3, H4 are accepted*). Factors *"Perceived risk," "Profitability, and stability"* have P Values > 0.1, which reflects that these factors are not statistically significant enough to show the relationship between the variable's negative influence. *"Sense the risk"* and the same direction of the variable *"Profitability and stability"* on the stock investment intention of young people living in Vietnam (*Hypotheses H4 and H5 are not accepted*).

Table 6: Path Coefficient of the structural model (Path Coefficient)

	Original Sample (O)	**Sample Mean (M)**	**Standard Deviation (STDEV)**	**T Statistics (|O/STDEV|)**	**P Values**
CCQ -> YDDTCK	0.349	0.348	0.062	5.606	**0.000**
CNRR -> YDDTCK	-0.027	-0.026	0.065	0.416	**0.678**
KNSL -> YDDTCK	0.073	0.074	0.048	1.537	**0.125**

NTKS -> YDDTCK	0.181	0.187	0.069	2.622	**0.009**
TDCK -> YDDTCK	0.166	0.166	0.079	2.085	**0.038**
TDTB -> YDDTCK	0.175	0.169	0.058	2.986	**0.003**

Source: Testing results using SMARTPLS by the research team

The test results in Table 6 show that with a reliability of 95%, *"Subjective norms"*(CCQ) have the strongest influence on the stock investment intention of young people living in Vietnam (0.349); Next comes the factor *"Perceived behavioral control"* (NTKS) with level affect 0.181; factor *"Attitude towards money"* (TDTB) has an impact level of 0.175; factor *"Attitude towards stock investment"*(TDCK) has an influence level of 0.166. Two factors *"Perceived risk"* and *"Profitability and stability"* are not statistically significant enough to conclude their influence on the dependent variable *"Intention to invest in stocks of young people living in Vietnam."*

Thus, we have the following regression model:

YDDT = 0.349*CCQ +0.181*NTKS+0.166*TDCK+0.175*TDTB

4.3.2.2. Evaluate the overall coefficient of determination R^2 (R square)

The results of the PLS Algorithm analysis give the R value^2, reflecting the level of explanation of the independent variable for the dependent variable. Index **R^2** measures the overall coefficient of determination (R-square value), which is an index to measure the degree of model fit of the data (the model's explanatory power). Hair & et al. (2010) suggested R-square values at 0.75, 0.50, or 0.25.

Table 7: Explanation coefficient of the independent variable for the dependent variable (R Square)

	R Square	**R Square Adjusted**
YDTCK	0.544	0.534

Source: Testing results of the research team

Results from Table 7 show that R^2 equals 0.544 and Adjusted - R^2 of 0.534 is appropriate in this case study, so the independent variables in the model explained 53.4% *"Intention to invest in stocks of young people living in Vietnam."*

4.3.2.3. Reliability index rating (SRMR)

Standardized Root Mean Square Residual (SRMR): This index indicates the suitability of the research model. According to Hu & Bentler (1999), normally, a suitable model will have an SRMR value of less than 0.08.

Table 8: Standardized Root Mean Square Residual (SRMR) reliability index

	Saturated Model	**Estimated Model**
SRMR	0.067	0.067

Source: Testing results of the research team

The SRMR research results in Table 8 of the research model are 0.067, smaller than 0.08. Therefore, this model is suitable for data analysis.

5. Some exchanges and discussions

Of the 6 factors taken into consideration, there are 4 factors at the 5% significance level (95% confidence) that have an impact on stock investment decisions of young people living in Vietnam. *"Subjective norms"* (CCQ) have the strongest influence on the stock investment intention of young people living in Vietnam with an influence of 0.349, meaning that when the subjective norms increase by 1 unit, the stock investment intention of young people living in Vietnam increased to 0.349 units; Next comes the factor *"Perceived behavioral control"* (NTKS) with an influence of 0.181, meaning that when perceived behavioral control increases by 1 unit, the intention to invest

in stocks of young people living in Vietnam increases by 0.181 units; element *"Attitude towards money"* (TDTB) has an impact level of 0.175, That is when the attitude towards money increase by 1 unit, young people's intention to invest in stocks increases by 0.175 units; element *"Attitude towards stock investment"* (TDCK) influences 0.166. This means that when young people's positive attitude toward stock investment increases by 1 unit, their investment intention increases by 0.166 units.

Subjective norms, according to the test results, have the greatest influence on the stock investment intention of young people living in Vietnam. Through calculations, it shows that: Among the 4 scales of the subjective standard factor, only the CCQ2 scale (Your friends will support your stock investment decision) has an average score of 3.511 at the threshold of *"Agree"* for the remaining scale CCQ1; CCQ3 and CCQ4 are at the threshold of *"Normal"* judgment. Therefore, it shows that from the family, school, and everyone around, there should be sharing and support for young people to equip young people with knowledge about stocks so that young people have more support and knowledge.

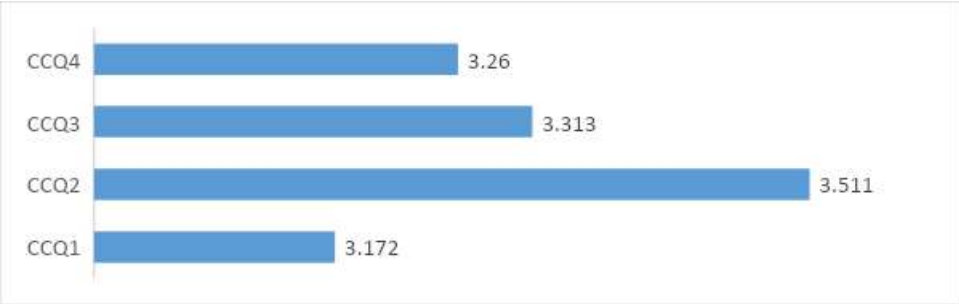


Figure 3: Average values of scales measuring the factor "Subjective norms"

Source: Compiled and calculated from survey results

Perceived behavioral control according to test results, is the factor with the second highest influence on the stock investment intention of Vietnamese youth. Calculating the average values of the scales shows that the scales are at the assessment level of *"Normal."* Therefore, there needs to be measures to help young people have more resources, understanding, time, and money for stock investment activities such as forming incubation funds and classes to improve knowledge. about investing and investing in stocks, or encouragement from relatives around them to help young people be more ready for their investment and stock investment activities.

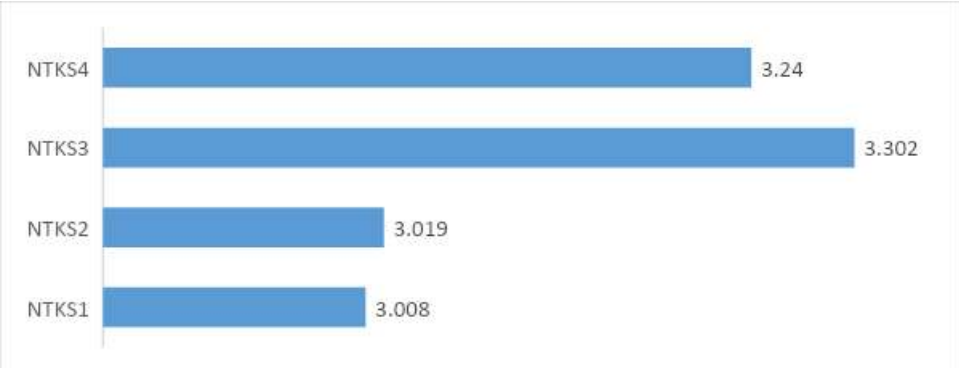


Figure 4: The average value of the variable "Perceived behavioral control"

Source: Compiled and calculated from survey results

Attitude towards money according to the test results, the factor has the third highest influence on the stock investment intention of Vietnamese youth. Calculating the average values of the scales has shown that the scales are at the assessment level *"Agree."* With Vietnamese young people, it can be seen that they have a serious look at the money they earn. To make this factor more clearly show its impact on young people's intention to invest in stocks, schools, and investment training units can give examples of billionaires around the world who are successful in the field of investment and stock investment to motivate learners and investors to have a more correct

view of money, creating a clearer view that the purpose of investing or Stock investing is ultimately a matter of money, and is the basis for improving the quality of life.

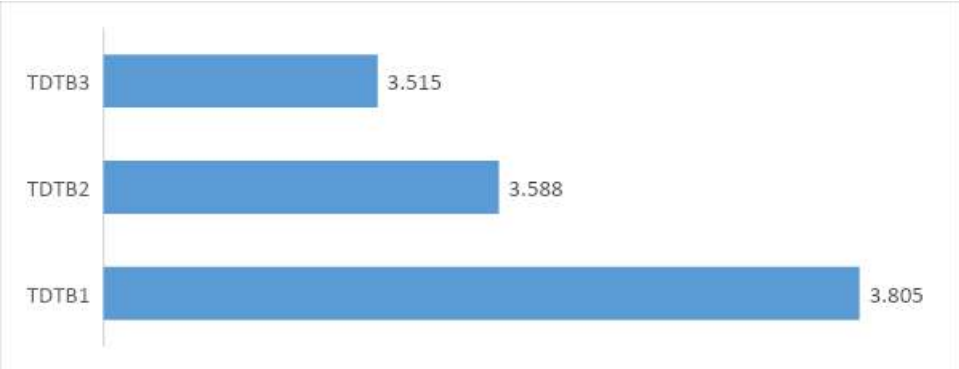
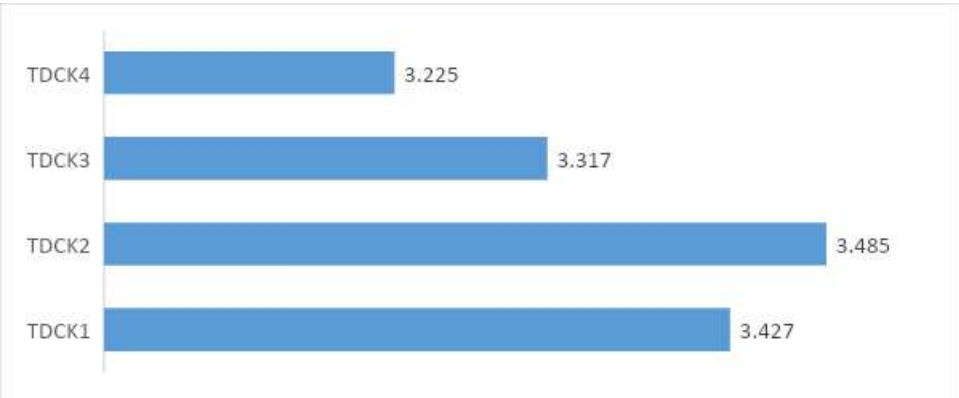


Figure 5: The average value of the variable "Attitude towards money"

Source: Compiled and calculated from survey results

Attitude towards stock investment, according to test results, is the factor with the lowest influence on the stock investment intention of Vietnamese youth. Calculating the average values of the scales shows that the two scales at the assessment level *"Agree"* are TDCK1, and TDCK2, and two scales at the judgment level *"Normal"* are TDCK3, and TDCK4. It can be seen that young people themselves also feel excited and want to participate in investing, investing in stocks as something they should do to bring many financial benefits. However, stock investing is not yet considered by young people as their passion and career path, so it is necessary to organize seminars, consultations, seminars, and discussions to raise awareness among young people. Young people today know about economic difficulties, uncertainties, and difficulties in production and business activities, so young people can see stock investment as a job worth considering.

Table 11: The average value of the variable "Attitude towards stock investment"



Source: Compiled and calculated from survey results

Two factors are Profitability and stability; Perceived risk, according to the test results, there is not enough statistical significance to conclude about the relationship with Vietnamese youth's stock investment intention. There needs to be measures to persuade young people to invest in securities, such as guarantees from securities companies regarding current securities investment models to enhance the reputation of the stock market. In addition, stock investment channels should also come up with their safety commitment policies for young investors before they make decisions or set up information channels (Facebook, Zalo, Instagram...) to answer questions from young investors when they need information and advice. In addition, there need to be measures from families, schools, training and career guidance centers, and classes to equip young people with knowledge about stock investment, both indirectly and directly. knowledge, skills, advice... so that young people have enough experience to invest in stocks and thereby arouse young people's intention to invest in stocks.

6. Conclusion

Initial research results show the relationship between factors affecting stock investment intentions of young people living in Vietnam, with a small sample size of 482 votes, of which 262 votes were from young people. have made investments and intend to invest in securities is valid to be included in the analysis of influencing factors. Along with the survey being convenient and random, this is also a limitation in sample size and questionnaire quality. In addition, with 6 factors included in the new model, it only explains 54.4% of the "Intention to invest in stocks of Vietnamese youth" and there are 4 statistically significant factors, 2 factors that are not statistically significant to conclude. Shows that other factors will affect the stock investment intention of Vietnamese youth. With the research results considered as a direction for further research on the intention to invest in different markets of Vietnamese youth, in the future the research team can expand the survey and research. Add factors and purposefully select and filter survey subjects to increase the sample size and quality of survey questionnaires, as well as the explanatory level of the model.

Author Contributions: All authors contributed to this research.

Funding: Not applicable.

Conflict of Interest: The authors declare no conflict of interest.

Informed Consent Statement/Ethics Approval: Not applicable.

References

Abul, S J. (2019). *Factors Influencing Individual Investor Behaviour Evidence from the Kuwait Stock Exchange*. Asian Social Science, 15(3), 27-39.

Ajzen, I. (1991). *The Theory of Planned Behavior.* Organizational Behavior and Human Decision Processes, 50, pp. 179 - 211.

Antoniou, A., Ergul, N., & Holmes, P. (1997). *Market efficiency, thin trading, and non-linear behavior: evidence from an emerging market*. European Financial Management, 3(2), 175-190. DOI: https://doi.org/10.1111/1468-036X.00038

Bagozzi, R. and Yi, Y. (1988). *On the Evaluation of Structural Equation Models.* Journal of the Academy of Marketing Sciences, 16, 74-94. http://dx.doi.org/10.1007/BF02723327.

Camerer, C. F., & Loewenstein, G. (2004). *Behavioral Economics: Past, Present, and Future. In Advances in Behavioural Economics C. F. Camerer, G. Loewenstein and M. Rabin, Eds., New York: Russell Sage Foundation.* Retrieved from https://press.princeton.edu/titles/7607.html

Chin, W. W. (1998). *The partial least squares approach for structural equation modeling. In G. A. Marcoulides (Ed.),* Modern methods for business research (pp. 295–336). Lawrence Erlbaum Associates Publishers.

Clark, L.A., & Watson, D. (1995). *Constructing validity: Basic issues in objective scale development.* Psychological Assessment, 7(3), 309–319. https://doi.org/10.1037/1040-3590.7.3.309

Comrey, A. L., & Lee, H. B. (1992). *A First Course in Factor Analysis (2nd ed.).* Hillsdale, NJ: Lawrence Erlbaum.

Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences (2nd ed.).* Hillsdale, NJ: Lawrence Erlbaum Associates, Publishers.

Devellis, R. (2012). *Scale Development Theory and Applications. Sage Publications,* New York.

Do Thi Hoa Lien (2021). *Factors affecting the readiness to start a business of graduates in Business Administration: a case study at the University of Labor and Social Affairs (Ho Chi Minh City campus).* Hue University Science Magazine: Economics and Development; pISSN: 2588–1205; eISSN: 2615–9716; Volume 131, Number 5C, 2022, Pg. 5–24, DOI: 10.26459/hueunijed.v131i5C.6522

Duyen, T.T.K (2022).*Factors affecting entrepreneurial intention of students after graduation in Danang City*. Master's Thesis in Business Administration

Fernandes, J., Peña, J.I., & Tabak, B. (2007).*Behavior Finance and Estimation Risk in Stochastic Portfolio Optimization.* Applied Financial Economics, 20(9), 1-61.

Fishbein, M & Ajzen, I (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research*. Addition- Wesley.

Fornell, C., & Larcker, D. F. (1981). *Evaluating structural equation models with unobservable variables and measurement error.* Journal of Marketing Research, 18(1), 39–50. https://doi.org/10.2307/3151312

Garson, G.D (2016). *Partial Least Squares: Regression and Structural Equation Models.* Statistical Associates Publishers, Asheboro.

Ha, P.V & colleagues (2022).*Research factors affecting investment decisions of individual investors on the Vietnamese stock market.* https://tapchicongthuong.vn/bai-viet/nghien-cuu-yeu-to-anh-huong-den-quyet-dinh-dau-tu-cua-nha-dau-tu-ca-nhan-tren-thi-truong-chung-khoan-viet-nam-89203.htm

Hanh, N (2024). *Investing is gradually popular among young people.* https://www.tinnhanhchungkhoan.vn/dau-tu-dang-dan-pho-bien-trong-gioi-tre-post339058.html

Hair, J. F., Anderson, R. E., Babin, B. J., & Black, W. C. (2010). *Multivariate data analysis: A global perspective.* Pearson Education, London.

Hair, J., Hult, T., Ringle, C., & Sarstedt, M. (2017). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM).* Thousand Oaks, CA: Sage Publications, Inc.

Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2016). *A primer on Partial Least Squares Structural Equation Modeling (PLS-SEM) (1st ed.).* Thousand Oaks, CA: Sage publications.

Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., & Thiele, K. O (2017). *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM) (2nd ed.).* SAGE Publications.

Henseler, J. and Sarstedt, M (2013). *Goodness-of-Fit Indices for Partial Least Squares Path Modeling.* Computational Statistics, 28, 565-580. https://doi.org/10.1007/s00180-012-0317-1

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). *A new criterion for assessing discriminant validity in variance-based structural equation modeling*. Journal of the Academy of Marketing Science, 43(1), 115-135.

Hieu, V.T, Phuoc, B.H, Vuong, B.N (2020).*The impact of behavioral factors on individual investors' decisions and investment efficiency on the Ho Chi Minh City stock market.* Economic - Technical Journal, 31(3)

Hoang Trong, Chu Nguyen Mong Ngoc (2005). *Analyze research data with SPSS*. Statistics Publishing House.

Hock, C., Ringle, C.M., & Sarstedt, M (2010). *Management of multi-purpose stadiums: Importance and performance measurement of service interfaces*. International Journal of Services Technology and Management, 14(2-3)

Hu, L. T., & Bentler, P. M. (1999). *Cutoff Criteria for Fit Indexes in Covariance Structure Analysis: Conventional Criteria versus New Alternatives*. Structural Equation Modeling, 6, 1-55. http://dx.doi.org/10.1080/10705519909540118

Hue, T.H.T (2019). HER*The influence of psychological factors on investment decisions in the Vietnamese stock market.*https://vjol.info.vn/index.php/DHHD/article/view/42222

Huong, T.H.D & colleagues (2021).*Investigating factors affecting entrepreneurial intention of Economics students in Hanoi City.* Banking Science and Training

Kahneman, D., & Tversky, A. (1979). *Prospect Theory: An Analysis of Decision under Risk.* Econometrica, 47(2), 263-291.

Kline, R. B. (2015). *Principles and Practice of Structural Equation Modeling.* Guildford Press.

Krueger, N. F., Reilly, M. D., & Carsrud, A. L. (2000). *Competing models of entrepreneurial intentions.* Journal of Business Venturing, 15(5), 411-432. doi: https://doi.org/10.1016/S0883-9026(98)00033-0

Lau, V. P., Dimitrova, M. N., Shaffer, M. A., Davidkov, T., & Yordanova, D. I. (2012). *Entrepreneurial readiness and firm growth: an integrated etic and emic approach.* Journal of International Management, 18(2), 147–159. doi:10. 1016/j.intman.2012.02.005.

Lignan, F., & Chen, Y. W. (2009). *Development and Cross–Cultural Application of a Specific Instrument to Measure Entrepreneurial Intentions.* Entrepreneurship Theory and Practice, 33(3), 593-617. doi: 10.1111/j.1540-6520.2009.00318.x

Lien, D. T. H. (2021). *Factors affecting the entrepreneurial readiness of bachelors of Business Administration: The case of University of Labour and Social Affairs (Campus Ho Chi Minh City).* Hue University Journal of Science: Economics and Development; pISSN: 2588–1205; eISSN: 2615–9716; Vol 131, NO 5C, 2022, Page. 5–24, DOI: 10.26459/hueunijed.v131i5C.6522

Masomi, S.R., & Ghayekhloo, S. (2011). *Consequences of human behaviors in economic: The effects of behavioral factors in investment decision making.* Tehran Stock Exchange International Conference on Business and Economics Research, 1(2), 234 - 237.

Narsurdin AM & Ahmed NH (2009). *Examining a Model of Entrepreneurial Intention Among Malaysians Using SEM Procedure.* European Journal of Scientific Research, 33(2), 365 - 373.

Prudential.com.vn (n.d). What is stock investment? Overview of stock investment. https://www.prudential.com.vn/vi/blog-nhip-song-khoe/dau-tu-chung-khoan-la-gi-tong-quan-dau-tu-chung-khoan/

National Assembly (2019). *Securities law.* Law No. 54/2019/QH14, https://thuvienphapluat.vn/van-ban/Chung-khoan/Luat-Chung-khoan-nam-2019-399763.aspx

Thuong, H. T (2014). *Factors affecting the entrepreneurial intention of University of Labour and Social Affairs students.* Ho Chi Minh City Open University Master's thesis.

Toan, H. K & colleagues (2021). *Analyzing factors affecting innovative entrepreneurial intention of Hue University students.* Hue University Journal of Science: Social Science and Humanities, Vol 131, NO 6A, 2022, Page. 209–225; DOI: 10.26459/hueunijssh.v131i6A.6585

Toan, N. D. & colleagues (2022). *Factors affecting the stock investment intention of individual investors in Vietnam in the context of the Covid-19 pandemic.* Hue University Science Magazine: Economics and Development, volume 131, number 5A, 129 - 150. DOI: 10.26459/hueunijed.v131i5A.6686

Toan, P. N & Long, N. T (2018). *Factors affecting investment decisions of individual investors on the Ho Chi Minh City stock market.* https://tapchicongthuong.vn/bai-viet/cac-nhan-to-anh-huong-den-quyet-dinh-dau-tu-cua-cac-nha-dau-tu-ca-nhan-tren-thi-truong-chung-khoan-thanh-pho-ho-chi-minh-58301.htm

Tuan, N. A (2018). *Factors affecting entrepreneurial intention of young people in Vietnam.* https://khoahoc.neu.edu.vn

Tung, H. T & Nguyen, H.C (2023). *These factors affect the investment intentions of Vietnamese youth.* International Journal of Social Science and Economic Research, ISSN: 2455-8834, Volume:08, Issue:09 "September 2023"

Sarstedt, M., Ringle, C. M., & Joseph F. Hair (2014). *Partial least squares structural equation modeling (PLS-SEM).* Handbook of Market Research. Springer International Publishing

Schwarz, E. J., Wdowiak, M. A., Almer-Jarz, D. A., & Breitenecker, R. J. (2009). *The effects of attitudes and perceived environment conditions on students' entrepreneurial intent: An Austrian perspective.* Education + Training, 51(4), 272-291. doi: doi:10.1108/00400910910964566

Shiller, R. J. (2015). *Irrational Exuberance: Revised and Expanded (3rd ed.)*. Princeton: Princeton University Press. https://doi.org/10.1515/9781400865536

vnexpress.net (2021). *Young people join the stock race.* https://vnexpress.net/gioi-tre-gia-nhap-duong-dua-chung-khoan-4397650.html

The Asian Institute of Research
Economics and Business Quarterly Reviews
Vol.7, No.1, 2024: 181-193
ISSN 2775-9237

DOI: 10.31014/aior.1992.07.01.568

Business Lobbying: A Systematic Literature Review

Bruno Perman Fernandes[1], Murillo Dias[2]

[1] Université of Bordeaux, France
[2] Fundação Getulio Vargas, Brazil

Correspondence: Murillo Dias, Praia de Botafogo, 190, Botafogo, Rio de Janeiro, Brazil.
Tel: +55-21-98191-7474. E-mail: agenda.murillo@gmail.com

Abstract
In this article, we conducted a systematic literature review (SLR) on Business Lobbying. Our objective was to map the evolution of the main theories over the past 124 years, by comparing them with COVID-19 literature from recent years. We extracted a total of 1,988 publication records from Google Scholar and Scopus using keyword searching, resulting in 3,174,947 citations. Based on these records, we performed a bibliometric analysis. A careful content analysis revealed that the scholarly research revolves mainly around three themes: (a) business lobby, (b) process, and (c) regional studies. The number of citations on business lobbying has multiplied seven-fold during the past 50 years and might double in the coming decades. Our article also suggests recommendations for future studies.

Keywords: Business Lobbying, Systematic Literature Review

1. Introduction

We present a Systematic Literature Review (SLR) on Business Lobbying as part of a doctoral thesis (Perman, 2024). Although traditional literature reviews offer a more flexible structure, an SLR is a comprehensive review covering numerous databases based on strict inclusion and exclusion criteria. It offers the advantage of identifying the leading authors in the field of research, trends in publications, and citations over a given period, following Hart (2018). After analyzing the data, we can present critical arguments in the literature review summary.

In sum, before presenting the SLR, we employed a systematic literature review (SLR) strategy in this study, following Goyal & Kumar (2020); Denyer & Tranfield (2009); Singh & Walia (2020); Hart (2018); Cheng et al. (2018); Prashar et al. (2020) which are discussed in following sections. The choice was made based on how widely accepted it was in bibliometric analyses.). Systematic Literature Reviews (SLR) have also attracted scholarly attention recently (Dias, Vivanco, L., Teixeira, E., 2024; Schmitz & Dias, M., 2023; Dias, M. et al., 2023b; Dias, M. et al., 2023c; Dias et al., 2022). Before delving into the review, we introduce two supporting theories of business lobbying best suited to the research objectives.

2.1. Supporting Theories

In this section, the perspectives of two supporting theories are disclosed: Agency Theory (Section 2.1.1), and Social Exchange Theory (Section 2.1.2). Next, the research objectives are summarized in Figure 1.

2.1.1. Agency Theory

Agency Theory is central to business lobbying activity. It is concerned with the relationship between agents in economic exchanges, where one actor (the principal) has control over the behavior of another actor (the agent) in his favor, and the agent's decisions affect the well-being of the principal.

A concrete example of the principal-agent in Brazilian business lobbying regards the adherence to the Agency Theory's main assumptions: (a) there is an economic relationship between principals and agents. In such a case, the principal should be the head of the Government Relations Department in a company and their agents or business lobbyists, who are workers that represent their principals in the Congress Senate, to intermediate negotiations between public servants, for instance. Who are paid to work with the principal and to represent the principal and, therefore, the company. (b) there is a power relationship between principals and agents once the business lobbyist is a worker who answers to their superiors in representing the interests of a business company.

From its origins in the information economy, Agency Theory has developed two branches: positivist and principal-agent (Jensen & Roeback, 1983). The contract between the principal and agent serves as the standard unit of analysis for both flows. They also hold similar beliefs regarding individuals, organizations, and data.

Therefore, the principal's well-being cannot be maximized because the principal and agent have distinct objectives and risk preferences (Wright et al., 1996). The principal is risk-neutral because it can select from various participants (Wiseman & Gomez-Meja, 1998). In contrast, a single principal agent is required to act contrary to risk (Williamson, 1963). To protect their assets, agents are risk averse. Therefore, agency theory is concerned with minimizing costs associated with the agency relationship. According to Hatch (1997), the agency problem entails the possibility of the agent acting contrary to the principal's interests. To avoid diverging interests, contracts align interests between agents and their principals.

According to Eisenhardt (1985), a principal's capacity to determine whether agents are acting in his best interests depends on the information available. This information can be obtained either directly by observing the agents' actions or tangentially by observing the agents' results. As the outcomes are not entirely dependent on the agents, they begin to assume a portion of the risk. In order to safeguard the interests of the principals, it is necessary to implement mechanisms that reduce the likelihood of agents acting inconsistently. According to Clegg, Hardy, and Nord (1996), agency costs are incurred in this endeavor. The total agency costs consist of the principal's spending on monitoring, the costs of agent dependence, and the principal's residual loss. Considering that agency costs exist, both principals and agents act to mitigate these costs and strike a balance between both parties. Arrow (1985) identified two primary causes of agency problems: moral hazard, which is associated with concealing actions, and adverse selection, which is associated with concealing information.

Conversely, adverse selection refers to agents with information that is obscure to the principal or whose procurement costs are high. Typically, two methods exist to resolve agency issues: monitoring and punishment. According to Clegg, Hardy, and Nord (1996), monitoring involves observing agents' performance, whereas penalization is the sanction for undesirable behavior.

2.1.2 Social Exchange Theory

The Social Exchange Theory is a theoretical framework investigating social behavior within interpersonal relationships. It employs a cost-benefit analysis approach to assess these interactions' potential risks and rewards. This idea encompasses many forms of social contact, including professional and transient connections and rudimentary transactions such as verbal exchanges. If the costs of a relationship outweigh the rewards, such as

putting effort or money into a relationship without reciprocation, the relationship may be terminated or abandoned (Thibaut & Kelley, 1959; Blau, 1964). Studies supporting this theory suggest that petitions allow the aggregation of dispersed information and allow policymakers to improve their choices when conflict is low and signals are relatively accurate.

Therefore, before engaging into a relationship involving a business lobbyist and a public servant, to give an example, parties evaluate the risks of such an involvement.

Additionally, they were conducted outside of Brazil, and it is geographically opportune to develop this veritably pioneering study in this country. Finally, in the next section, the findings of the systematic literature review on business lobbying are detailed and further discussed.

2.2. The perspective of Business Lobby: Review Objectives

Although narrative literature reviews are commonplace in most research scenarios, they do not provide an overview of trends in the field or the top authors and publications. Recency and relevance searches are the main guiding principles for narrative literature reviews. Conversely, Systematic Literature Reviews provide a broader view of trends and ranks (Goyal & Kumar, 2020; Denyer & Tranfield, 2009; Singh & Walia, 2020; Hart, 2018; Cheng et al., 2018); Prashar et al., 2020), which helps deepen the subject analysis.

Therefore, we conducted a Systematic Literature Review (SLR) on Business Lobbying, resulting in n = 988 publication records extracted from Google Scholar and Scopus through keyword searching, including the words “Business” and “Lobbying,” with the Boolean operator “AND,” resulting in more than one million citations (see Table 2). Based on these records, the study performed bibliometric analysis to identify trends in the field, including the top 20 authors (see Table 3).

Despite multiple search possibilities, only published research was investigated, excluding unpublished papers, such as laws, regulations, grey papers, and finally, patents, as outlined in the upcoming sections.

2.3. Search Strategy

We conducted a review of the global scientific literature on Business Lobbying, following the guidelines provided by Goyal and Kumar (2020). Our primary objective was to map the existing research on the topic. Additionally, we followed Zahoor & Talba's (2020) approach to organizing research objectives, which included (i) identifying the leading publications on the topic and (ii) using citation network and text network analysis to identify influential research studies and emerging trends. Our findings are summarized in Table 1.

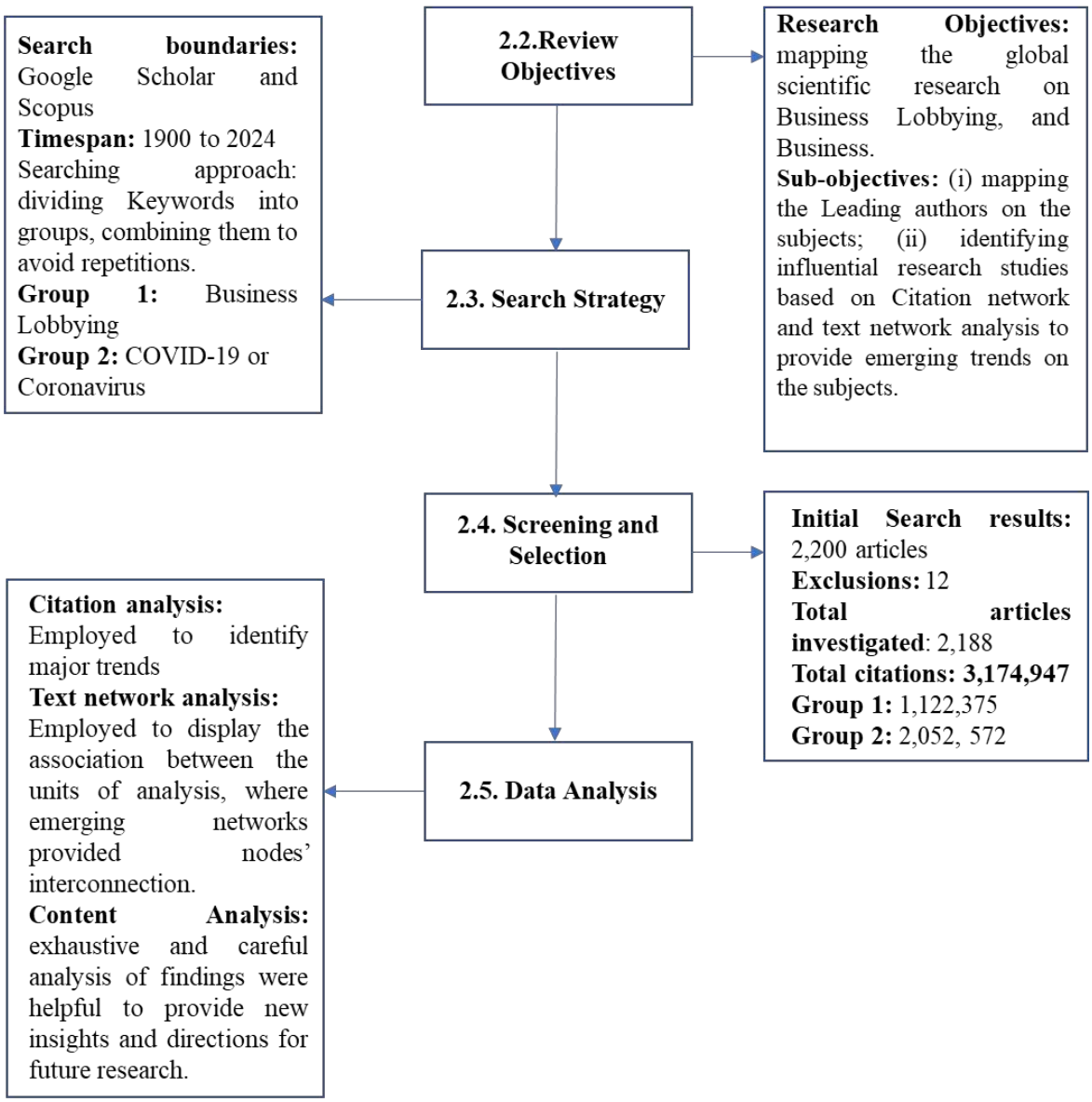


Figure 1: Research Design

2.4. Screening and Selection

Table 1 illustrates the total number of valid sources and exclusions, abiding by the software limitations, such as (a) Google Scholar, limited to 1,000 results per search, and (b) Scopus, limited to 200 results per search, as a default.

Table 1: Source/Exclusions

Source/Exclusion	**Total**
Scopus + Google Scholar	2.200
Exclusions	212
Total Valid sources	**1.988**

Table 1 shows that 212 (9.6 percent) out of 2,200 publications were excluded due to failing to meet the established criteria or because they were duplicates. Nine hundred eighty-eight valid sources resulted in approximately one million citations (see Table 2). We also used Publish or Perish (Harzing, 2007) to examine the research coverage from 1900 to the present—the search parameters contained only English-language terms. The databases Google

Scholar and Scopus were selected as the academic datasets. After the initial round with Publish or Perish (Harzing, 2007), a text network analysis was conducted to identify the most pertinent emerging themes. These were then used as keyword entries in a subsequent iterative round.

Table 2: Business Lobby (1900-2023)

Timeline	Business Lobbying	
	Publication	Citation
1900-1949	2	2.498
1950-1969	5	8.173
1970-1979	15	76.293
1980-1989	56	53.302
1990-1999	198	252.359
2000-2009	390	397.759
2010-2023	322	331.991
Total	**988**	**1.122.375**

2.5. Data Analysis

Table 2 shows 1,122,375 citations from 1,988 valid sources from 1900 to date. The iterative process led to several sessions to accomplish the research findings. The themes were organized into two groups, such as (a) Process, and (b) Regional Study. Analysis indicated cases where the word "Business Lobby," or simply "Lobby," appeared in the title but in the keywords "Business Lobbying," therefore, satisfying the inclusion criteria.

2.5.1. Trend Analysis

Between 1900 and 2023, Figure 2 depicts the number of publications in Business per year. Since the 1980s, the quantity of publications has increased steadily. This phenomenon may be attributed to the emergence of the Internet, which made information accessible to everyone. Conversely, the number of publications decreased in 2020, mainly because of COVID-19 (Dias et al., 2023, 2023b).

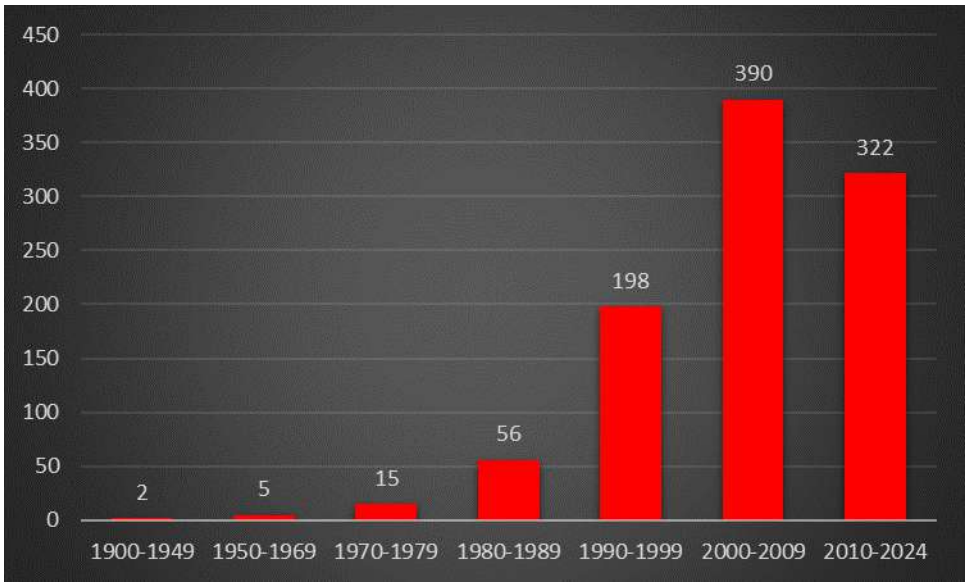


Figure 2: Business Lobbying Publications (1900-2024)

In addition, Figure 3 illustrates total citations from 1900 to 2024. Note that from 2000 to 2009, the most considerable frequency (397,759 citations), representing approximately 35 percent of the total number of citations, was as follows:

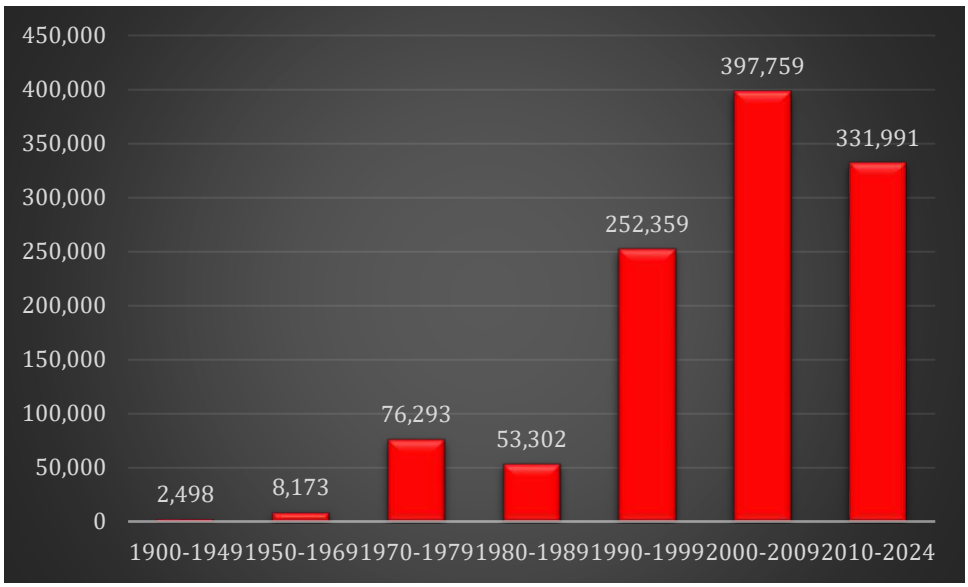


Figure 3: Business Lobbying Citations (1900-2023)

As mentioned earlier, the COVID-19 research had a direct impact on the number of citations (Dias et al., 2023; 2023b). The pandemic caught the attention of scholars across the world, affecting various research fields, including business lobbying. To illustrate the comparison between Business Lobbying and COVID-19 or the coronavirus pandemic, Table 3 and Figure 4 have been included.

Table 3: Business Lobbying and COVID-19 Citations (1900-2024)

Timeline	Business Lobbying	Coronavirus or COVID-19
1900-1949	2.498	0
1950-1969	8.173	0
1970-1979	76.293	1.020
1980-1989	53.302	2
1990-1999	252.359	4.580
2000-2009	397.759	75.288
2010-2023	331.991	1.971.682
Total	**1.122.375**	**2.052.572**

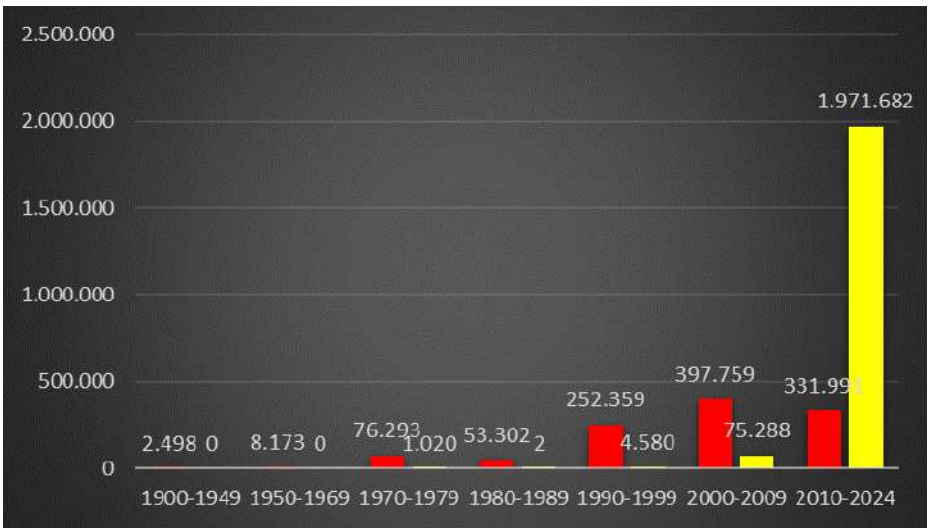


Figure 4: Business Lobbying and COVID-19 Citations (1900-2024)

2.5.2. Network text analysis

Thematic clusters were discovered using a network map of the keywords, titles, and abstracts on the assumption that phrases clustered together would reflect related topics. Figure 5 depicts network text analysis utilizing normalization and density-based spacing clustering techniques. Using www.infrandus.com, we created a network graph from the text-based data, which provided insights and patterns based on the network properties, precisely the terms "Business Lobbying." Each color represents a cluster. Therefore, the current issues and emerging trends in the field were identified by perusing each cluster's research papers with attention.

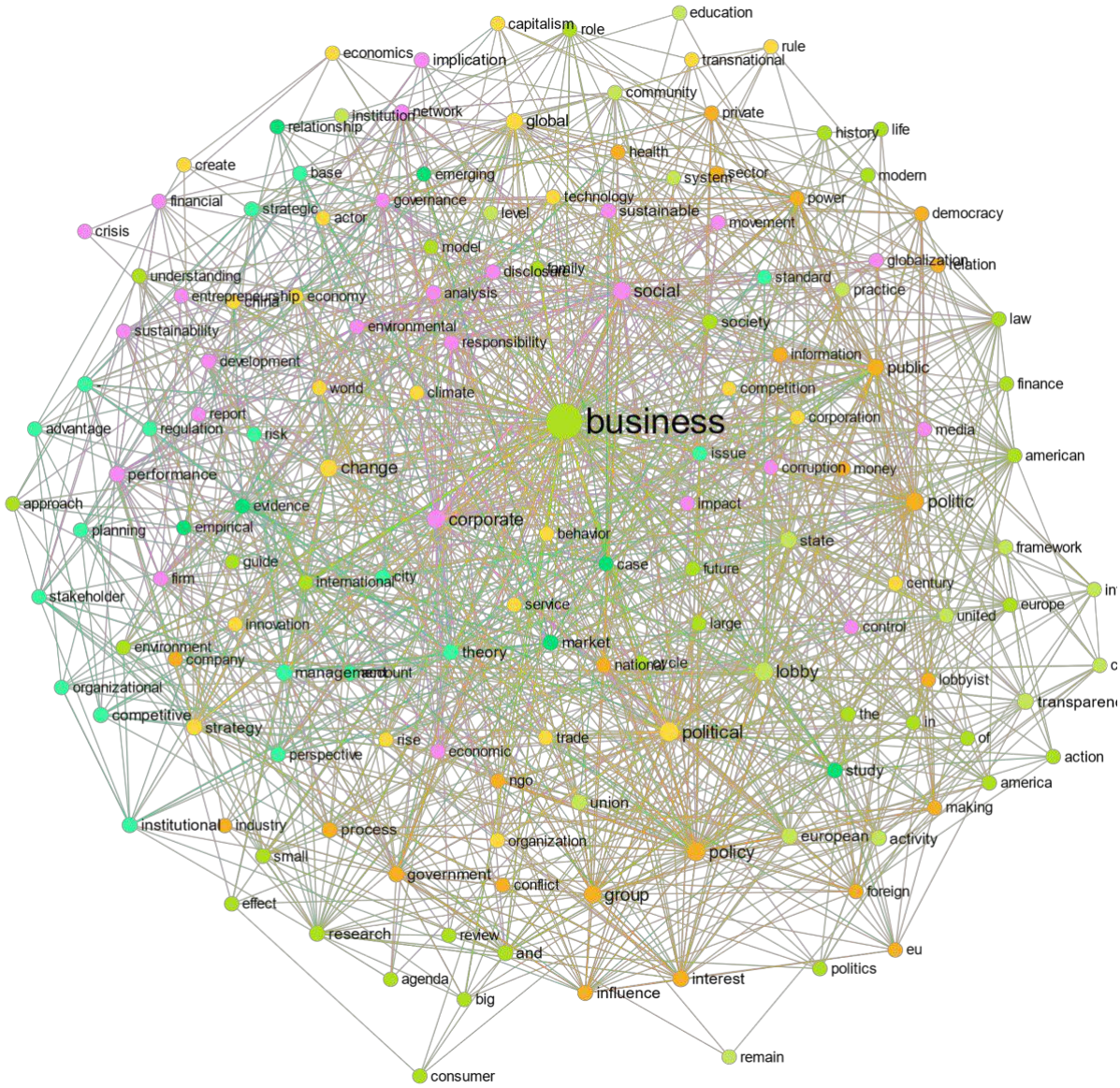


Figure 5: Text Network Analysis.
Source: InfraNodus.com

Figure 9 shows interconnections between “business” (highlighted in green) with the words “lobby,” “state,” and “transparency,” amongst others. This advantage compares SLR with word frequency distribution and word cloud analysis (Hart, 2018).

2.5.3. Top 20 publications

SLR findings on the top 20 most influential authors are illustrated in the following Table 4:

Table 4: Top 20 Most influential authors

Rank	Citation	Author(s)	Year	Journal
1	1.928	TM Liggett	2012	Academy of management review
2	1.372	RL Hall, AV Deardorff	2006	American Political Science Review
3	1.198	BK Richter, K Samphantharak…	2009	American Journal of …
4	1.164	P Bouwen	2002	Journal of European public policy
5	707	MR Baye, D Kovenock, CG De Vries	1993	The american economic review
6	696	J Beyers	2004	European Union Politics
7	658	FR Baumgartner, BL Leech	2001	The Journal of Politics
8	630	D Coen	1997	Journal of European Public Policy
9	566	P Utting	2005	Development in practice
10	561	M Bertrand, M Bombardini, F Trebbi	2014	American Economic Review
11	557	RF Doner, BR Schneider	2000	Business and politics
12	526	D Mitra	1999	American Economic Review
13	521	D Coen	2007	Journal of European Public Policy
14	505	C Mahoney	2007	Journal of Public Policy
15	482	A Dür	2008	European Union Politics
16	433	D Coen	1998	Journal of Public Policy
17	161	P Bernhagen, NJ Mitchell	2009	European Union Politics
18	94	JM Drope, WL Hansen	2006	Business and Politics
19	85	T Lawton, T Rajwani	2011	European Business Review
20	53	S DellaVigna, R Durante, B Knight…	2016	American Economic Association

Source: Harzing, 2007

Table 4 illustrates the most influential authors in the research field, ranked by the number of citations. An iterative process kept articles from widely recognized as distinct journals, such as the Academy of Management Review and the American Political Science Review. Please observe that the most influential research is not the most recent because we are more concerned with quality than recency. It may take time for recent articles to be extensively cited.

2.5.4. Thematic Analysis

Two themes emerged from the SLR on the Business Lobbying thematic analysis: (a) business lobby; (b) process; (c) regional studies. Table 5 summarizes the emerging themes from content and network analysis regarding the most influential authors in practice, and also because the thematic analysis proved a valuable resource for providing the research gap discussed in the upcoming section.

Table 5: Emerging Themes

Author(s)	Year	Theme	
		Process	Regional Study
TM Liggett	2012	yes	no
RL Hall, AV Deardorff	2006	yes	yes
BK Richter, K Samphantharak…	2009	yes	no
P Bouwen	2002	yes	yes
MR Baye, D Kovenock, CG De Vries	1993	yes	no
J Beyers	2004	yes	yes
FR Baumgartner, BL Leech	2001	no	no
D Coen	1997	yes	yes
M Bertrand, M Bombardini, F Trebbi	2014	yes	no
RF Doner, BR Schneider	2000	yes	no
D Mitra	1999	yes	no
D Coen	2007	yes	yes
C Mahoney	2007	yes	yes
A Dür	2008	no	yes
D Coen	1998	no	yes
P Bernhagen, NJ Mitchell	2009	no	yes
JM Drope, WL Hansen	2006	yes	no
T Lawton, T Rajwani	2011	yes	no
S DellaVigna, R Durante, B Knight…	2016	no	yes

Source: Harzing, 2007

Table 5 shows the emerging themes “process” and “regional studies” as complementary evidence regarding the research gap, introduced in the following sections. However, before presenting the research gap, there are some remaining noteworthy considerations, such as research limitations and discussion on the analysis of findings, detailed in the next section.

We collected the affiliations of the publications from the .csv file obtained from Publish or Perish (Harzing, 2007). The geographical distribution of the top publications is shown in Figure 6 using Google My Maps at https://www.google.com/intl/pt-BR/maps/about/mymaps/.

Figure 4: Geographical location of publications

2.6. Research Limitations, Implications, and Discussion

This research is limited to (a) published papers, excluding grey papers; (b) Business and Lobbying keywords; (c) Google Scholar and Scopus databases; (d) Publish or Perish (PoP) software algorithm; and (e) InfraNodus.com cloud processing parameters. Other papers, such as conference papers, regulations, and other software or databases, are not part of the scope of the present study and should be investigated separately.

This chapter investigated the current epistemology of Business Lobbying and supporting theories, such as Agency and Social Exchange theories (Sections 2.1.1 and 2.1.2, respectively), and Business Lobbying, which is the unit of analysis of this work, investigated through a systematic literature review. Although the analysis of the findings revealed trends and "champions" of Business Lobbying from 1900 to date, some important considerations are noteworthy: (i) the number of publications and citations were affected somehow by the entrance of internet technology in the 1990s; (ii) atypical situations like the COVID-19 somehow interfered with the number of publications and citations because coronavirus research has attracted drastically scholars' attention from 2020 to 2022; situations (i) and (ii) were revealed in the analysis and are helpful to understand the research trends on business lobbying; (iii) algorithms are not perfect. In many circumstances, the keywords found did not refer primarily to Business Lobbying; instead, the research focus was something else, such as business strategy. Therefore, only through careful text analysis could we exclude duplicated entries to deal with reliable evidence. (iv) In worst cases, only text analysis on the abstracts proved to be the best article selection approach. (v) New articles generally have fewer citations than older ones. Once again, text analysis was paramount, so separate most cited articles, but with less research significance.

Next, the text analysis ultimately proved to be a valuable source of information for the research gap determination, as detailed in the upcoming section. Table 5 shows the findings from the thematic analysis: whereas most researchers focus their attention on regional studies (Hall & Deardorff, 2006; Richter & Samphanthark, 2009; Bouwen, 2002; Baye et al., 1993; Beyers, 2004; Baumgartner & Leech, 2001; Coen, 1997; Bertrand et al., 2014; Doner & Schneider, 2000; Mitra, 1999), for instance, others addressed the process of business lobbying (Bertrand et al., 2014; Doner & Schneider, 2000; Mitra, 1999), while others studied both themes (Coen,1997;2007;

Mahoney,2007; Bouwen, 2002). Other subthemes were also considered as noteworthy to business lobbying: (a) global trade (Woll, 2008); (b) influencing oligarchies (Frye, 2002); (c) environmental groups (Gullberg, 2008); (d) professionalization, strategy, and influence (Santos et al., 2017), and (e) organized interests (Lowery, 2007).

Finally, despite the multiple emerging themes and subthemes in this SLR, more evidence was needed regarding the influencing factors on business lobbying in the Brazilian scenario. In sum, we could observe the research trends in the Business Lobbying research field over the past 124 years and visualize the most influential publications in the sector, which proved to be a valuable resource for determining the research gap as to orient our research efforts in tackling the most suitable research approaches to address the factors affecting the activity in Brazil.

Author Contributions: All authors contributed to this research.

Funding: Not applicable.

Conflict of Interest: The authors declare no conflict of interest.

Informed Consent Statement/Ethics Approval: Not applicable.

References

Baumgartner, FR, & Leech, BL (2001). Interest niches and policy bandwagons: Patterns of interest group involvement in national politics. The Journal of Politics, journals.uchicago.edu, https://doi.org/10.1111/0022-3816.00106

Baye, MR, Kovenock, D, & Vries, CG De (1993). Rigging the lobbying process: an application of the all-pay auction. The american economic review, JSTOR, https://www.jstor.org/stable/2117512

Bernhagen, P, & Mitchell, NJ (2009). The determinants of direct corporate lobbying in the European Union. European Union Politics, journals.sagepub.com, https://doi.org/10.1177/1465116509103366

Bertrand, M, Bombardini, M, & Trebbi, F (2014). Is it whom you know or what you know? An empirical assessment of the lobbying process. American Economic Review, aeaweb.org, https://www.aeaweb.org/articles?id=10.1257/aer.104.12.3885

Beyers, J (2004). Voice and access: Political practices of European interest associations. European Union Politics, journals.sagepub.com, https://doi.org/10.1177/1465116504042442

Bouwen, P (2004). Exchanging access goods for access: A comparative study of business lobbying in the European Union institutions. European Journal of Political Research, Wiley Online Library, https://doi.org/10.1111/j.1475-6765.2004.00157.x

Cheng, H., Clymer, J. W., Chen, B. P. H., Sadeghirad, B., Ferko, N. C., Cameron, C. G., & Hinoul, P. (2018). Prolonged operative duration is associated with complications: a systematic review and meta-analysis. Journal of Surgical Research, 229, 134-144.

Coen, D (1997). The evolution of the large firm as a political actor in the European Union. Journal of European Public Policy, Taylor &Francis, https://doi.org/10.1080/135017697344253

Coen, D (1998). The European business interest and the nation state: large-firm lobbying in the European Union and member states. Journal of Public Policy, cambridge.org, https://www.cambridge.org/core/journals/journal-of-public-policy/article/european-business-interest-and-the-nation-state-largefirm-lobbying-in-the-european-union-and-member-states/5EF7C4BDDD482630261803F9E54C79CF

Coen, D (2007). Empirical and theoretical studies in EU lobbying. Journal of European Public Policy, Taylor &Francis, https://doi.org/10.1080/13501760701243731

Coen, D, & Richardson, J (2009). Lobbying the European Union: institutions, actors, and issues., books.google.com, https://books.google.com/books?hl=en&lr=&id=NBlXzej9stkC&oi=fnd&pg=PR5&dq=business+lobbying&ots=ouog2kbTtn&sig=TAhtUeU_cLGjuxF4Vu5lBRi8X3k

Cohen, L., & Malloy, C. J. (2014). Friends in high places. American Economic Journal: Economic Policy, 6(3), 63–91.

Cycles and Microeconomics. *International Journal of Applied Science, 7*(1), 18-33; https://doi.org. 10.5281/zenodo.10566368

Denyer, D., Tranfield, D. (2009) Producing a systematic review. In: *The Sage handbook of organisational research methods* (pp. 671–689). Sage.

Denzin, N.K. (2001). *Interpretive Interactionism* (2nd Ed.) Sage.

Dias, M., Lafraia, J.,Schmitz, T. & Vieira, P. (2023). Systematic Literature Review on Negotiation & Conflict Management. *European Journal of Theoretical and Applied Sciences, 1*(3), 20-31; https://doi.org.10.59324/ejtas.2023.1(3).03

Dias, M., Pereira, L., Vieira, P., Barbosa, L., Quintão, H., Lafraia, J. (2023) Mediation & Dispute Board Resolution: A Systematic Literature Review. *GPH-International Journal of Social Science and Humanities Research,6*(5), https://doi.org/ 10.5281/zenodo.7952719

Dias, M., Vieira, P., Pereira, L., Quintão, H., Lafraia, J. (2023) Leadership Theories: A Systematic Review Based on Bibliometric and Content Analysis. *GPH-International Journal of Business Management, 6*(5), 1-16; https://doi.org/10.5281/zenodo.7937272

Dias, M., Vivanco, L., Teixeira, E. (2024) A Systematic Literature Review on Business Cycles and Microeconomics. International Journal of Applied Science, 7(1), 18-33; https://doi.org. 10.5281/zenodo.10566368

Dias, M., Pereira, L; Vieira, P., Pan, Juliana (2022) From Plato to e-Leaders: The Evolution of Leadership Theories and Styles. *Economics and Business Quarterly Reviews, 5* (2), 133-146, https://doi.org/ 10.31014/aior.1992.05.02.420

Doner, RF, & Schneider, BR (2000). Business associations and economic development: Why some associations contribute more than others. Business and politics, cambridge.org, https://www.cambridge.org/core/journals/business-and-politics/article/business-associations-and-economic-development-why-some-associations-contribute-more-than-others/80BFA7537971DEE48B0143A253103BB4

Drope, JM, & Hansen, WL (2006). Does firm size matter? Analyzing business lobbying in the United States. Business and Politics, cambridge.org, https://www.cambridge.org/core/journals/business-and-politics/article/does-firm-size-matter-analyzing-business-lobbying-in-the-united-states/E42D18249C89D6AE473AE1C210447A05

Dür, A (2008). Measuring interest group influence in the EU: A note on methodology. European Union Politics, journals.sagepub.com, https://doi.org/10.1177/1465116508095151

Frye, T. (2002). Capture or exchange? Business lobbying in Russia. Europe-Asia Studies, 54(7), 1017-1036.

Goyal, K., Kumar, S. (2020) Financial literacy: a systematic review and bibliometric analysis. *Int. J. Consum.Stud. 45*(1), 80–105

Gullberg, A. T. (2008). Lobbying friends and foes in climate policy: The case of business and environmental interest groups in the European Union. *Energy Policy, 36*(8), 2964-2972.

Hall, RL, & Deardorff, AV (2006). Lobbying as legislative subsidy. American Political Science Review, cambridge.org, https://www.cambridge.org/core/journals/american-political-science-review/article/lobbying-as-legislative-subsidy/AE4B5D8AB9C2487BB78C2A51BB53E03F

Harmon, N., Fisman, R., & Kamenica, E. (2018). Peer effects in legislative voting [The Institute for Economic Development Working Paper Series dp-304]. Department of Economics, Boston University, Boston, MA.

Hart, C. (2018). *Doing a Literature Review: Research the Research Imagination.* Sage, 2nd Edition.

Liggett, TM (1999). Stochastic interacting systems: contact, voter and exclusion processes., books.google.com, https://books.google.com/books?hl=en&lr=&id=z-UJcQxwv4EC&oi=fnd&pg=PA1&dq=business+lobbying&ots=SkVnPHDOvE&sig=_PzafYjWf14Y6Pqn6D_0VpfUuB8

Lowery, D. (2007). Why do organized interests Lobby? A multi-goal, multi-context theory of lobbying. *Polity, 39*(1), 29-54. https://doi.org/10.1057/palgrave.polity.2300077

Mahoney, C (2007). Lobbying success in the United States and the European Union. Journal of Public Policy, cambridge.org, https://www.cambridge.org/core/journals/journal-of-public-policy/article/lobbying-success-in-the-united-states-and-the-european-union/B824B88B08895B8B316A37647F3CF6B3

Mitra, D (1999). Endogenous lobby formation and endogenous protection: a long-run model of trade policy determination. American Economic Review, aeaweb.org, https://www.aeaweb.org/articles?id=10.1257/aer.89.5.1116

Perman, Bruno (2024) *Factors Influencing Business Lobbying: The Case of Brazil* [Doctoral dissertation, Université de Bordeaux].

Prashar, A., Sunder M.V. (2020) A bibliometric and content analysis of sustainable development in small and medium-sized enterprises. *J. Clean. Prod. 245*, 118665.

Santos, M. L., Mancuso, W. P., Baird, M. F., & Resende, C. A. D. S. (2017). *Lobbying no Brasil: profissionalização, estratégias e influência*.

Singh, S., Walia, N. (2020) Momentum investing: a systematic literature review and bibliometric analysis. Manag. Rev. Q. https:// doi. org/ 10. 1007/ s11301- 020- 00205-6

Thibaut, J.W., & Kelley, H.H. (1959). *The social psychology of groups*. John Wiley.
Utting, P (2005). Corporate responsibility and the movement of business. Development in practice, Taylor &Francis, https://doi.org/10.1080/09614520500075797
Victor, J. N., & Ringe, N. (2009). The social utility of informal institutions: caucuses as networks in the 110th U.S. House of Representatives. American Politics Research, 37(5), 742–766.
Woll, C. (2008). *Firm interests: How governments shape business lobbying on global trade*. Cornell University Press.
Zahoor, N., Al-Tabbaa, O.: Inter-organisational collaboration and SMEs' innovation: a systematic review and future research directions. Scand. J. Manag. 36(2), 101109 (2020)

The Asian Institute of Research
Economics and Business Quarterly Reviews
Vol.7, No.1, 2024: 194-201
ISSN 2775-9237

DOI: 10.31014/aior.1992.07.01.569

The Influence of Financial Literacy and Financial Attitude on Financial Management Behavior

Muhammad Bayu Aji Sumantri[1], Tanti Irawati Mukhlis[2], Neneng Susanti[3], Oliver Hasan Padmanegara[4], Pebri Yanida[5], Vincentia Wahju Widajatun[6]

[1,2,3,4,5,6] Faculty of Economic and Business, Widyatama University, Bandung, Indonesia

Correspondence: Muhammad Bayu Aji Sumantri, Faculty of Economic and Business, Widyatama University, Bandung, West Java. E-mail: muhammad.bayu@widyatama.ac.id

Abstract
This study aims to examine the influence of financial literacy and financial attitude on financial management behavior among first-semester students in Bandung. This qualitative research uses a primary data collection technique through questionnaires. The sample consists of 117 participants selected using purposive sampling. Structural Equation Modeling is employed in the data analysis, which includes testing the outer and inner models. The results indicate that financial literacy does not have a significant influence on financial management behavior. However, the other variable, financial attitude, has a significant impact on financial management behavior.

Keywords: Financial Literacy, Financial Attitude, Financial Management Behavior

1. Introduction

The ability to manage personal finances is becoming increasingly important in today's world. People need to plan for long-term investments for retirement and their children's education. They also need to decide on short-term savings for vacations, home payments, car loans, and other expensive items. Additionally, they must manage their own health and life insurance needs. Awareness of financial issues is becoming more critical with the development of recent trends, such as mortgage crises, shifts from defined benefit plans to defined contribution plans, and concerns about complexity in the overall financial products industry (Henager & Cude, 2019). Awareness of financial literacy issues and their adverse effects on our economy is growing. Fortunately, there is a resurgence of interest in financial education and related policies. Financial literacy, which evaluates the extent to which an individual understands and utilizes information related to personal finances, plays a significant role in managing daily finances more effectively. It helps individuals, for example, to more effectively manage debt or make wiser decisions in saving (Kalwij et al., 2019). Even teenagers must make choices regarding cell phone contracts, student loans, debit card usage, or clothing purchases. One of the factors driving increased interest in financial education issues or assessing financial capabilities is the continuous growth in individual and household debt levels (Opletalová, 2015). The only way to eliminate this phenomenon is by increasing financial awareness through

education, not only in schools but also in community classes, primarily implemented with government support. Integrating financial skills into elementary and secondary school education programs may be one way to prevent unhealthy debt burdens and to manage and create financial reserves. Including financial education in elementary and secondary school curricula is a significant step forward because prevention is considered the most effective action. Children learn financial literacy before they have their own financial responsibilities or bad experiences with money. They will only manage financial matters when they are adults, but by then, they already have an awareness of potential risks. Therefore, it can be assumed that the generation taking financial education courses will be more prepared for life, and only with them will the situation in this area improve significantly. Financial literacy is defined as a person's intelligence or ability to manage their finances effectively. Many people believe that financial literacy is designed to make it harder for them to enjoy the money they earn and to limit them. However, with financial literacy, individuals can use their financial resources properly to achieve their financial goals and enjoy life.

Previous research examining financial literacy and its relationship to how individuals manage their finances has been conducted in various countries. Amagir et al. (2020) examined financial literacy among high school students in the Netherlands. Their research produced several findings, including that involving parents in financial education can result in higher levels of financial literacy. Then, financial socialization factors, such as discussing money issues with peers and parents, are more strongly related to attitudes toward money and financial behaviors than financial education provided in high school. For young people involved in family financial decision-making, there is a positive impact on financial planning and thinking before acting. Financial experiences, such as receiving pocket money and having part-time jobs, are measured and proven to be related to financial knowledge. Cameron et al. (2014) conducted research examining financial literacy among high school students in New Zealand and identified associated factors. Financial literacy was found to be lowest among students who were financially poorer, had lower English language proficiency, and had lower mathematics abilities. However, relative poverty and lower English language proficiency did not affect financial literacy at the highest cognitive level, which is the ability to apply financial knowledge. Gilenko & Chernova (2021) found from their research that introducing appropriate financial literacy programs at early stages, such as in high school, can have a positive impact on the savings habits of Russian teenagers. This underscores the importance of introducing financial education early on to promote financial well-being and stability. This study also offers suggestions to financial authorities, institutions, and commercial banks in Russia. These suggestions can help in designing effective financial literacy programs and policies that address specific factors affecting the level of financial literacy and savings behavior of Russian teenagers. Then, research conducted by Mandell (2009) found that while financial education in high school and college only had a limited positive impact on students' financial literacy, it had beneficial effects on some aspects of financial behavior. Therefore, the inability to increase financial literacy scores should not be the sole reason to stop teaching personal finance courses to high school students. The success of a personal finance course should not only be assessed based on cognitive achievement test results, as its goal is to influence future behavior. Education alone is not enough to prevent consumers from making financial mistakes, considering that even the most educated and sophisticated investors can make mistakes. Further research on adults who graduated from high school in the last two decades will help to better understand the effectiveness of financial education in high schools.

Financial literacy, as described by Gilenko & Chernov (2021), refers to the awareness, knowledge, skills, attitudes, and behaviors needed to make informed financial decisions and achieve individual financial well-being. It consists of several components: financial knowledge, financial attitudes, and financial behaviors. Financial knowledge involves understanding key financial concepts and the attributes of financial products and services. Financial attitudes reflect individuals' beliefs and values regarding money, savings, and future planning. Financial behaviors refer to specific actions taken by individuals, such as budgeting, saving, and setting financial goals, which ultimately determine their financial well-being. Another understanding of financial literacy is also presented by Cameron et al. (2014), referring to the awareness, knowledge, skills, attitudes, and behaviors required for individuals to make wise financial decisions and achieve financial well-being. This involves the ability to understand and apply financial knowledge in various contexts, such as managing personal finances, making informed financial choices, and understanding available financial products and services. Additionally, according to Amagir et al. (2020), financial literacy is defined as a combination of financial knowledge, attitudes toward

money, financial self-efficacy, and financial behaviors that support the application of financial knowledge in everyday financial decision-making. It includes knowledge and understanding of financial concepts and risks, as well as skills, motivation, and beliefs to apply this knowledge to make effective decisions in various financial contexts. In addition to knowledge, financial literacy also includes attitudes toward money, financial self-efficacy (belief in the ability to manage money), and financial behaviors (actual financial actions). Financial literacy is defined in English by Noctor, Stoney, and Stradling (1992) as the 'ability to make effective judgments and take decisions regarding the use and management of money.' Schagen and Lines (1996, p. 91) operationalize this definition by proposing that financially literate individuals will possess a range of abilities and attitudes, including understanding key concepts important in money management such as knowledge of financial institutions, systems, and services, a range of skills, both general and specific, and attitudes that enable effective and responsible financial management.

Financial attitudes according to (Amagir et al., 2020) Financial attitudes refer to the beliefs and perceptions that individuals hold about money and its role in their lives. Attitudes toward money are influenced by factors such as power and prestige, financial planning, the belief that money is a symbol of success, and the importance of money in one's life. Attitudes toward money are considered one element of financial literacy, along with financial knowledge, financial self-efficacy, and financial behaviors. Financial attitudes are found to be related to financial behaviors and can influence individual financial decision-making. Additionally, according to Gilenko & Chernova, (2021) Financial attitudes refer to an individual's beliefs and values related to money, savings, and future planning. This affects whether individuals will take appropriate financial actions or not. Positive financial attitudes towards savings are expected to be formed through mastery of financial knowledge and values related to the importance of having a financial safety net and future planning. These positive attitudes are then expected to be reinforced through regular saving behaviors. On the other hand, negative financial attitudes can lead to actions that worsen an individual's financial well-being, such as delaying bill payments or lack of planning for future expenses. This paper highlights the importance of incorporating financial attitudes as a component of financial literacy and emphasizes its role in shaping individual financial behaviors.

Financial management behavior refers to the actions and decisions that individuals or households take in managing their finances. This includes how one manages their money, including how they earn, spend, save, and invest their money. Financial management behavior also includes how one manages debt, creates budgets, and sets financial goals. Financial management behavior can vary from one individual to another. It is influenced by various factors, including financial knowledge, attitudes toward money, personal values, financial circumstances, and past experiences. Good financial management behavior typically includes practices such as saving money for the future, avoiding unnecessary debt, budgeting, and investing wisely. Financial literacy policies and programs are often designed to help individuals improve their financial management behavior. Thus, according to these background the hypotheses of this research are:
H1: Financial Literacy has a significant effect on Financial Management Behavior
H2: Financial Attitude has a significant effect on Financial Management Behavior

2. Method

The data analysis technique used to discuss the issues in this research is Structural Equation Modeling (SEM). Structural Equation Model (SEM) is a statistical technique that allows testing a relatively complex set of relationships simultaneously (Ghozali, 2014). Path diagram aims to determine the influence of independent variables on dependent variables using mediating variables. The path diagram explicitly provides causal relationships between variables based on theory (Hardinis, 2019). Complex relationships can be built between one or more dependent variables and one or more independent variables. There may also be a variable that plays a dual role, as an independent variable in one relationship but a dependent variable in another, due to the presence of cascading causal relationships.

This study uses primary data obtained through questionnaires from first-semester students in Bandung City. The data analysis technique used is a quantitative analysis method assisted by SmartPLS software. Before hypothesis testing, this research conducted a preliminary test of the Outer Model consisting of reliability and validity tests.

Then, the Inner Model test was conducted on the structural model to test the relationships between latent constructs.

This study uses Financial Literacy and Financial Attitude as independent variables. Meanwhile, as the dependent variable, this study uses the Financial Management Behavior variable. The operationalization of the variables used is as follows:

Table 1: Operationalization of Variables

Variables	Definition	Dimension	Scale
Financial Literacy (X1)	A person's knowledge about financial instruments	• Basic Financial Knowledge • Savings • Loans • Insurance • Investments	Likert Scale
Financial Attitude (X2)	Financial attitude is defined as the state of mind, opinion, and judgment about finances.	• Saving • Budgeting • Frugality	Likert Scale
Financial Management Behavior (X3)	A way of managing the funds one has, which relates to an individual's responsibility in managing finances.	• Budget • Cash flow • Savings	Likert Scale

3. Results

In the Results section, summarize the collected data and the analysis performed on those data relevant to the discourse that is to follow. Report the data in sufficient detail to justify your conclusions. Mention all relevant results, including those that run counter to expectation; be sure to include small effect sizes (or statistically nonsignificant findings) when theory predicts large (or statistically significant) ones. Do not hide uncomfortable results by omission. Do not include individual scores or raw data with the exception, for example, of single-case designs or illustrative examples. In the spirit of data sharing (encouraged by APA and other professional associations and sometimes required by funding agencies), raw data, including study characteristics and individual effect sizes used in a meta -analysis, can be made available on supplemental online archives.

3.1 Outer Model Test

In the Outer Model assessment, Measurement is used to assess indicator variables that reflect a construct. Empirical analysis serves as the validity and reliability of constructs that reflect the parameters of latent variables based on theory and empirical studies. Several criteria used in performing data analysis techniques using SmartPLS include Convergent Validity, Internal Consistency, and Discriminant Validity tests (Hair, 2010). Provide dates defining the periods of recruitment and follow-up and the primary sources of the potential subjects, where appropriate. If these dates differ by group, provide the values for each group.

3.2 Convergent Validity Test

Convergent Validity is one of the tests that show the relationship between indicators and their latent variables. In measuring these latent variables, the magnitude of the loading factor value is determined, which is a value generated by each indicator. An indicator is considered valid if it has a value >0.7. The initial loading factor values obtained are as follows:

Table 2: Convergent Validity Test

Indicator	Financial Literacy (X1)	Financial Attitude (X2)	Financial Management Behaviour (Y)	Result
X1.1	0.625			Not Valid
X1.10	0.763			Valid
X1.2	0.643			Not Valid
X1.3	0.514			Not Valid
X1.4	0.802			Valid
X1.5	0.461			Not Valid
X1.6	0.476			Not Valid
X1.7	0.694			Not Valid
X1.8	0.715			Valid
X1.9	0.818			Valid
X2.1		0.689		Not Valid
X2.2		0.728		Valid
X2.3		0.775		Valid
X2.4		0.702		Valid
X2.5		0.738		Valid
X2.6		0.691		Not Valid
Y.1			0.722	Valid
Y.2			0.777	Valid
Y.3			0.638	Not Valid
Y.4			0.641	Not Valid
Y.5			0.784	Valid
Y.6			0.780	Valid

Based on the table above, it can be seen that the data is the initial processing data on the convergent validity values of each indicator before any changes or modifications. By looking at the loading factor values of each indicator, it can be determined whether the indicator is valid or not. Therefore, it can be found that indicators X1.1, X1.2, X1.3, X1.5, X1.6, X1.7 in the financial literacy variable are not valid. Then, in the Financial Attitude variable, it was found that indicators X2.1 and X2.6 are not valid. In the Financial Management Behavior variable, it was found that indicators Y.3 and Y.4 are not valid. Next, modifications were made to each invalid indicator by removing it from the model and recalculating. After recalculating, the loading factor values obtained are as follows:

Table 3: Convergent Validity Test

Indicator	Financial Literacy (X1)	Financial Attitude (X2)	Financial Management Behaviour (Y)	Result
X1.10	0.841			Valid
X1.4	0.839			Valid

X1.8	0.737			Valid
X1.9	0.861			Valid
X2.2		0.770		Valid
X2.3		0.810		Valid
X2.4		0.721		Valid
X2.5		0.755		Valid
Y.1			0.735	Valid
Y.2			0.833	Valid
Y.5			0.787	Valid
Y.6			0.780	Valid

Based on the data in the table above, it can be seen that the loading factor values of each indicator in each variable are above 0.7. Therefore, all of these indicators are considered valid as measures of their latent variables.

3.3 Discriminant Validity Test

Discriminant Validity is the value of the cross-loading factor that is useful for determining whether a construct has adequate discrimination by comparing the loading values on the intended construct with the loading values of other constructs.

Table 4: Discriminant Validity Test

Indicator	Financial Literacy (X1)	Financial Attitude (X2)	Financial Management Behaviour (Y)
X1.10	**0.841**	0.516	0.370
X1.4	**0.839**	0.477	0.474
X1.8	**0.737**	0.414	0.351
X1.9	**0.861**	0.525	0.450
X2.2	0.458	**0.770**	0.537
X2.3	0.454	**0.810**	0.621
X2.4	0.470	**0.721**	0.516
X2.5	0.428	**0.755**	0.648
Y.1	0.341	0.617	**0.735**
Y.2	0.441	0.627	**0.833**
Y.5	0.403	0.552	**0.787**
Y.6	0.404	0.599	**0.780**

In the table above, it can be seen that the cross-loading values for each indicator of each variable already have the highest cross-loading factor compared to the cross-loading values of other indicators of other variables. This indicates that each variable can be said to have good discriminant validity.

3.4 Validity and Reliability Test

The Outer Model is used to analyze the relationship between indicators and constructs. It is also used to ensure the validity and reliability of the data used. Testing is done using Composite Reliability (CR), Average Variance Extracted (AVE), and Cronbach's Alpha.

Table 5: Reliability and Validity Test

	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Financial Literacy	0.838	0.892	0.674
Financial Attitude	0.763	0.849	0.585
Financial Management Behavior	0.791	0.865	0.615

The AVE values for all variables, ranging from Financial Literacy, Financial Attitude, to Financial Management Behavior, are above 0.5, which is acceptable. Meanwhile, the composite reliability values are at an acceptable level, which is above 0.7.

3.5 Structural Model Test (R Squared)

The testing of the structural model (inner model) is conducted to determine the strength of the relationships between constructs based on the significance values of the R-Square values of a research model. The R-Square value indicates how much the independent variables influence the dependent variable.

Table 6: R Squared

	R Square	R Square Adjusted
Financial Management Behavior	0.590	0.583

In the table above, it can be noted that the R-Square value of the Financial Management Behavior variable is 0.590. Therefore, it can be concluded that the Financial Management Behavior variable can be explained by Financial Literacy and Financial Attitude by 59%, while the remaining 41% is explained by other variables outside of this study.

3.6 Hypotheses Test

Hypothesis testing was conducted using the bootstrapping resampling method. This testing was done by examining the T Statistic values and P Values. The following are the calculation results obtained using the bootstrapping method.

Table 7: Hypotheses Test

Path Coefficient	Original Sample (O)	Sample Mean (M)	Standard Deviation	T Statistics	P Values
Literasi Keuangan	0.086	0.082	0.103	0.830	0.407
Sikap Keuangan	0.715	0.723	0.074	9.719	0.000

In testing using Smart PLS, statistical testing on each hypothesized relationship is done using simulation. Testing using bootstrapping is used to minimize problems with the non-normality of the research data, as well as the results of the testing. The following are the results of the bootstrapping:

1) The Influence of Financial Literacy on Financial Management Behavior
   The hypothesis testing results on the relationship between Financial Literacy and Financial Management Behavior show a path coefficient value of 0.086, indicating a positive relationship. Furthermore, in these hypothesis testing results, there are P values and T Statistics for each variable. For the Financial Literacy variable, the T Statistics value is 0.830 and the P Values is 0.407. Thus, it can be concluded that the Financial Literacy variable does not have a significant influence on Financial Management Behavior.
2) The Influence of Financial Attitude on Financial Management Behavior
   The hypothesis testing results on the relationship between Financial Attitude and Financial Management Behavior show a path coefficient value of 0.715, indicating a positive relationship. Furthermore, in these hypothesis testing results, there are P values and T Statistics for each variable. For the Financial Attitude variable, the T Statistics value is 9.719 and the P Values is 0.00. Thus, it can be concluded that the Financial Attitude variable has a significant positive influence on Financial Management Behavior.

4. Discussion

Based on the analysis and various tests that have been conducted, the next step is to discuss the results of the data processing in the study. The variables studied in this research are financial literacy as X1, financial attitude as X2, and financial management behavior as Y. Financial literacy is the knowledge and understanding of financial

concepts used to make financial decisions more effectively. With financial literacy, students will be able to allocate their finances well, thus avoiding financial risks. In testing using SEM, the financial literacy variable is concluded to not have a significant influence on financial management behavior. This result is contrary to several previous studies that found financial literacy significantly affects financial management behavior. This is an interesting point of concern because according to the concept, the higher a person's understanding of financial literacy, the better their financial management behavior should be. The research result ultimately proves that financial literacy does not always influence financial management behavior, indicating that there are other factors that can influence financial management behavior. This result also shows that the level of financial literacy is not always directly proportional to financial management behavior. This means that when someone has good financial literacy, it does not always result in good financial management. Furthermore, it was found that the financial attitude variable has a significant influence on financial management behavior. This research result is in line with previous studies that found financial attitude significantly affects financial management behavior. This is also consistent with the existing concept that financial attitude has a positive impact on financial management behavior. This means that the better someone's financial attitude is, the better their financial management behavior will be.

Author Contributions: All authors contributed to this research.

Funding: This research was funded by LP2M Universitas Widyatama grant number 36/SPC1/P/LP2M-UTAMA/XI/2023.

Conflict of Interest: The authors declare no conflict of interest.

Informed Consent Statement/Ethics Approval: Not applicable.

References

Amagir, A., Groot, W., van den Brink, H. M., & Wilschut, A. (2020). Financial literacy of high school students in the Netherlands: knowledge, attitudes, self-efficacy, and behavior. *International Review of Economics Education*, *34*. https://doi.org/10.1016/j.iree.2020.100185

Cameron, M. P., Calderwood, R., Cox, A., Lim, S., & Yamaoka, M. (2014). Factors associated with financial literacy among high school students in New Zealand. *International Review of Economics Education*, *16*(PA), 12–21. https://doi.org/10.1016/j.iree.2014.07.006

Gilenko, E., & Chernova, A. (2021). Saving behavior and financial literacy of Russian high school students: An application of a copula-based bivariate probit-regression approach. *Children and Youth Services Review*, *127*(June), 106122. https://doi.org/10.1016/j.childyouth.2021.106122

Henager, R., & Cude, B. J. (2019). Financial Literacy of High School Graduates: Long- and Short-Term Financial Behavior by Age Group. *Journal of Family and Economic Issues*, *40*(3), 564–575. https://doi.org/10.1007/s10834-019-09626-2

Kalwij, A., Alessie, R., Dinkova, M., Schonewille, G., van der Schors, A., & van der Werf, M. (2019). The Effects of Financial Education on Financial Literacy and Savings Behavior: Evidence from a Controlled Field Experiment in Dutch Primary Schools. *Journal of Consumer Affairs*, *53*(3), 699–730. https://doi.org/10.1111/joca.12241

Mandell, L. (2009). The Impact of Financial Education in High School and College On Financial Literacy and Subsequent Financial Decision Making. *The American Economic Association*, 1–38. https://www.aeaweb.org/conference/2009/retrieve.php?pdfid=507

Opletalová, A. (2015). Financial Education and Financial Literacy in the Czech Education System. *Procedia - Social and Behavioral Sciences*, *171*, 1176–1184. https://doi.org/10.1016/j.sbspro.2015.01.229

Noctor, M., Stoney, S. and Stradling, R. (1992) "Financial Literacy", a report prepared for the National Westminster Bank, London

Schagen, S. and Lines, A. (1996) *Financial Literacy in Adult Life: a Report to the NatWest Group Charitable Trust* (Slough, Berkshire: National Foundation for Educational Research)

The Asian Institute of Research
Economics and Business Quarterly Reviews
Vol.7, No.1, 2024: 202-209
ISSN 2775-9237

DOI: 10.31014/aior.1992.07.01.570

Exploration of the Training Model of Applied Management Accounting Talent in the Context of Digital Intelligence

Zhangwei Mao[1], Jialu Wu[2], Xiangdong Xu[3]

[1,2,3] Zhejiang University of Finance and Economics Dongfang College, Haining 314408, China

Abstract
Against the background of digital intelligence, digital intelligence applied management accounting has become an inevitable choice for the cultivation of accounting personnel in colleges and universities. However, the outdated concept of "emphasis on accounting and neglect of management" has not been changed in time by multiple entities, such as enterprises and universities, which has led to the cultivation of accounting personnel in colleges and universities. Due to the deviation from demand, enterprises and schools have fallen into the dilemma of supply and demand, which has constrained the sustainable and healthy development of domestic enterprises. There is an urgent need to explore the training mode of digital intelligence application-oriented management accounting talent. Based on an in-depth analysis of the literature at home and abroad and a full investigation of the current status, it is found that the current domestic training of digital intelligence applied management accounting talent is mainly faced with the entrenched thinking of "light management," a lack of clear training orientation, an absence of multisynergic education, and a lack of training resources. Insufficient conditions, imperfect training models, and the decoupling of supply and demand for talent training are among the problems. In response to the above problems, the "ternary fusion" dynamic teaching model, the diverse and flexible teaching and testing model, the "one engine, two drivers" collaborative education model and the "internal student and external introduction" teacher training model have been established to aid in the application of number intelligence in China. Cultivation of management accounting talent.

Keywords: Digital Age, Application-Oriented, Management Accounting Talent, Training Mode

1. Introduction

In August 2013, China officially entered the era of digital intelligence (Du & Deng, 2022). With the continuous advancement of the digital age, the rapid development and wide application of emerging digital technologies are urging digital transformation in all social and economic fields. In the process, emerging digital technologies such as artificial intelligence have gradually penetrated various industries and wreaked havoc on most traditional industries. Financial accounting is one of the major impacts. In the digital finance era, artificial intelligence represented by financial robots can use big data processing capabilities to efficiently and accurately complete the workload of financial accountants for approximately five days within minutes, greatly reducing accounting costs (Du & Deng, 2022). Therefore, it has naturally taken over the vast majority of accounting work, such as mechanical numerical calculations and statistics. The demand for accounting talent has changed from financial accounting,

which is responsible for basic accounting and information transfer, to management accounting, which helps managers achieve the optimal use of resources by controlling and planning enterprises' human, financial, material and other resources (Guo, 2023).

As an enterprise's decision-making and control system, management accounting provides important support for ensuring the orderly operation of an enterprise's internal management (Liu et al., 2020). It should comply with the requirements of the digital age and actively grasp and use digital technology to improve the quality of decision-making information and reduce the company's operating costs. In this regard, the Ministry of Finance clearly proposed in the "Plan for the Development of Talents for the Accounting Industry (2021-2025)" that the cultivation of high-level digital intelligence application-oriented talent who is proficient in the profession and can skillfully use digital technology and have both strategic thinking and innovation ability is clearly proposed. Management accounting talent (Li & Dong, 2022). As the training bases for management accounting talent in China, colleges and universities should shoulder the important task of meeting the needs of the digital transformation of enterprises for digital intelligence application-oriented management accounting talent. Therefore, how to cultivate digital intelligence application-oriented management accounting talent that meets the needs of the current development has become an important topic that colleges and universities need to explore.

2. Literature review

2.1 Evolution of the competency framework of applied management accounting talent

At present, there are two main research subjects in the competency framework of applied management accounting talent. The first is accounting professional groups. In 1999, for the first time, the American IMA Institute proposed evaluation indicators for management accountants' functions; these indicators included nine modules, namely, management and cost accounting, which symbolized the beginning of the study on the management accounting competency framework. In 2014, the CIMA and AICPA established a competency framework for certified global management accountants based on "ethics, integrity and professionalism," which includes four modules: interpersonal skills, technical skills, management skills and leadership skills (Peng, 2017). In 2016, the American IMA Institute once again proposed five core competencies for management accountants—operation, technology, planning and reporting, decision-making and leadership—and refined them into 28 core competencies. In 2019, the CGMA released the latest competency framework for management accounting, which for the first time added digital skills in addition to interpersonal, technical, business, and leadership skills and was the first competency framework to meet the needs of the digital age (Ding, 2021). The next group includes folk scholars. Zhang et al. divided management association plans into two types—assistant type and management type—and defined the core abilities that different types of talent need to possess, including nine abilities—financial management and planning ability and budget management ability (Dai, 2018). Based on the new IMA competency framework for management accountants, Guo proposed the competency framework of applied management accounting talent of "six-dimensional fields + multidimensional capability elements," which specifically included strategy, planning and performance, reporting and control, technology and analysis, business acumen and operation, and leadership. abilities, professional ethics and values (Guo, 2022). Zhang et al. established the MA-CMM capability framework based on the capability maturity model and the latest capability framework of CGMA for reference and subdivided it into five levels according to capability maturity to achieve accurate capability positioning (Zhang, Kong, & Yin, 2020).

2.2 Reform of the training model for applied management accounting talent

Albrecht et al. proposed that accounting education should emphasize the teaching of basic accounting principles and principles and the training of skills. The theory can be consolidated through case teaching, practical operation can be realized through internship experience, and wide-scale curriculum system design integrated into group cooperation can cultivate the multidimensional ability of management accounting. R Rudman et al. believe that teamwork ability is very important for applied management accounting and advocate teamwork projects as an important tool in the teaching of applied management accounting. By strengthening classroom interaction between teachers and students and improving classroom teaching, Xin Chunhua proposed a "dual-subject and three-

dimensional interaction" teaching model based on a problem-based teaching strategy, a case teaching strategy and a heuristic teaching strategy. Based on the CDIO concept, Wei Li established the practical teaching mode of applied management accounting majors, which realized the organic integration of the concept of higher engineering education and the teaching of applied management accounting (Li, 2013). Cheng Ping and Wang Jianjun constructed a financial digital application ability training model based on the CDIO concept (Cheng & Wang, 2018). Yunchao Du and Haoying Deng used blockchain technology to create an innovative training model for digital intelligence application-oriented management accounting talent that is jointly supported by three major chains: the private chain, the alliance chain and the public chain (Cheng & Wang, 2018).

In summary, current academia has conducted research on applied management accounting talent from different perspectives and has achieved some results, but there are still two problems to be solved urgently. First, the theoretical foundation of digital-intelligence applied management accounting talent is still weak. Most of the current literature is based on the perspective of application-oriented management accounting talent, and there is still a large gap in the research on digital intelligence application-oriented management accounting talent. Second, the research on the existing capability framework and the research on training models are independent of each other. At present, studies related to the ability framework and training models of digital intelligence-applied management accounting talent continue to emerge, but the general problem is that the correlation is not strong. There are few studies on the construction of training models based on the predecessors' ability frameworks or the implementation of the ability framework and training models in the same paper. A study on related innovations. In view of this, this paper hopes to make breakthroughs in the theoretical basis and results correlation to provide reference experience for related research.

3. Interpretation of the current status and problem analysis of digital intelligence training applied to management accounting talent

3.1 The idea of "light management" is deeply ingrained, and the training positioning is not yet clear

According to the probability of 365 occupations being eliminated in the digital age, jointly completed by the BBC and the University of Cambridge, the probability of financial accounting, with bookkeeping and audit as its basic function, being eliminated by AI is 97.6%, ranking third (Guo, 2023). The shift in the demand for accounting talent from financial accounting to management accounting has become an irresistible trend. However, in their actual work, most enterprises lack forward-looking awareness, ignore the important value of digital intelligence applied to management accounting talent in promoting the realization of digital transformation and sustainable development, and still maintain the traditional thinking of "emphasis on accounting over management," which constrains accounting talent's ability to achieve digital transformation and sustainable development. The training of digital intelligence applied management accounting talent has been promoted. Second, academia has not yet paid enough attention to numerically applied management accountants. At present, there are very few studies based on the perspective of digital intelligence applied to management accounting talent, and there is a large gap in this area. In the end, some colleges and universities have been keenly aware of the changes in the market environment and have made active attempts to cultivate application-oriented management accounting talent. For example, the Central University of Finance and Economics independently established the Department of Management Accounting and adopted the form of enterprise-university cooperation to develop the department. Students will undergo joint training (Ma, 2023). However, our survey reveals that the current orientation of accounting talent in most colleges and universities is still inclined toward financial accounting; management accounting is offered only as a professional elective course and is taught mostly by financial accounting teachers; and the setting of digital technology courses is even more unsatisfactory. The current training positioning of digital intelligence applied management accounting talent in colleges and universities is not clear and is still being explored.

3.2 Lack of diversified and coordinated education and insufficient training resources

The shortage of training resources is a common problem in colleges and universities in China, and the root cause lies in the absence of a diversified and coordinated education mechanism. The training of digital intelligence applied management accounting talent is a systematic project that requires the collaborative participation and

support of multiple subjects. However, in reality, due to the deviation of the value orientation of each principal educator and the unclear boundary of the educational responsibility, the situation in which colleges and universities are fighting alone has little effect. First, from the perspective of enterprises, due to the intensification of market competition, enterprises are increasingly focusing on the protection of their core trade secrets, while enterprise-school cooperation is bound to cause the flow of personnel and technology, resulting in relative transparency within the enterprise. The gains are minimal, which is not in line with the economic thinking of enterprises to "maximize their interests." Therefore, the practicability of enterprise-school cooperation in educating talent is not strong, and enterprises have failed to fully support technical resources. Second, from the perspective of the government, the current organizing and guiding role of the government in the process of diverse and coordinated education is still not in place, and the functional positioning and interest mechanism of each subject have not been well coordinated. In addition, its support for the training of digital intelligence-applied management accounting talent needs to be improved. The absence of relevant policies and incentive mechanisms has increased funding pressure for talent training and reduced actual operability. Finally, from the perspective of colleges and universities, while digital technology is changing the accounting knowledge system, it also has a corresponding increase in the ability requirements of teachers. Teachers need to not only have solid theoretical knowledge and rich practical experience but also have mastery of digital technology and the ability to provide accounting knowledge. integrated into the teaching. However, most existing teachers specialize in professional theories, and there are very few of the top three teachers, "digital + theory + business," who can meet the training needs of number-intelligent applied management accounting talent, which directly constrains the progress of the training and implementation of number-intelligent applied management accounting talent.

3.3 The training model is still not perfect, and the supply and demand for talent training are decoupled

At present, the training mode of numerically applied management accounting talent in colleges and universities generally has the following problems. First, the textbooks are outdated and lack the integration of cutting-edge technologies. At present, most management accounting textbooks in China still focus on the five basic functions of management accounting and lack the integration of content related to cutting-edge digital technology such as accounting big data analysis and processing technology. As a result, talent training lags behind the needs of enterprises for new business activities. Second, the curriculum system deviates from needs, resulting in low training efficiency. At present, colleges and universities have not yet adjusted the focus of the accounting curriculum system. The existing theoretical practice courses of the accounting profession still focus on traditional financial accounting, the presence of management accounting courses is low, and the number of management accounting courses in most colleges and universities lags behind the current development. There is a lack of interdisciplinary disciplines in mathematics and science. In addition, the problem of "emphasizing theory over practice" is common in the training of management accounting personnel in China, and most colleges and universities have never offered management accounting training courses. This curriculum system, which only emphasizes theoretical knowledge and neglects practical ability and interdisciplinary innovation, makes it difficult to cultivate students' comprehensive abilities and plunges enterprises and schools into the dilemma of supply and demand. Third, teaching assessment methods lag behind, and the training goal of rebellious thinking is set. In terms of teaching mode, "crash-style" passive theoretical study still plays a dominant role, and the lack of heuristic and exploratory practical teaching makes it difficult to arouse the enthusiasm of students. In terms of assessment forms, the assessment forms of management accounting courses are still based on theoretical statements and face-to-face answers, which mainly assess textbook knowledge and are seldom combined with actual cases; thus, they fail to measure students' management decision-making ability and data processing and analysis ability. The goal of the strategic thinking of "integration of industry and finance" is contradictory.

4. Exploration of the training model of applied management accounting talent in the context of digital intelligence

4.1 Construction of a "ternary fusion" dynamic teaching model to achieve the goal of cultivating top-notch talent

First, the framework of talent training capability should be clarified, and the training objectives of top-notch talent should be formulated. The primary prerequisite for cultivating numerically applied management accounting talent

is the formulation of reasonable and complete training objectives for numerically applied management accounting talent, and the basic project for setting the training objectives for digitally applied management accounting talent is a clear and systematic number-intelligent applied management approach. Accounting talent competency framework. On the basis of fully investigating and analyzing the talent orientation in the current employment market, this paper chose the MA-CMM capability framework (Zhang, Kong, & Yin, 2020), which is more in line with the training positioning of undergraduate management accounting talent, and formulated the following training objectives in combination with the current status of digital intelligence applied management accounting talent in colleges and universities. : Undergraduate digital intelligence applied management accounting talent should have professional ability, digital technology application ability, management ability, leadership ability, and interpersonal ability and reach the applicable level. That is, "digital + theory + business" is among the top three talents with compound professional knowledge and strong practical ability.

Second, the focus of the curriculum should be transferred in response to the training orientation of the job market. On the basis of retaining the core courses of financial accounting, colleges and universities should reasonably increase the proportion of management accounting courses. The knowledge points that overlap more between management accounting and other courses can be appropriately deleted or merged; the explanation and assessment of the unique knowledge points of management accounting should be emphasized. In addition, colleges and universities should accelerate the improvement and innovation of the management accounting course system, e.g., innovating the management accounting practical training teaching system and constructing a structure consisting of basic management accounting training (practical cases), postpractical training (project practice) and comprehensive training (enterprise practice), which is a three-stage progressive training model [9] that trains students' business analysis ability, leadership and interpersonal communication skills and promotes the integration of theoretical knowledge and practical experience.

Third, a new cross-disciplinary discipline of mathematics should be added to enhance the ability of the integrated application of mathematics. A qualified digital intelligence application-oriented management accounting talent training curriculum system must not only enable students to understand and master digital technology but also, more importantly, enable students to perform management accounting functions more efficiently and accurately through the use of digital technology. Therefore, it is necessary for colleges and universities to encourage the development of digital technology. Collaborate among disciplines to create emerging interdisciplinary disciplines of mathematics and sciences. These include big data financial analysis, the application of Python in management accounting, etc., to achieve the integration and improvement of professional ability and digital technology application ability.

Fourth, a training feedback adjustment mechanism should be established to dynamically update the curriculum system. Colleges and universities need to set up a training program research team. The team is responsible for regularly tracking and surveying the satisfaction degree and opinions of the on-the-job graduates and interns who have been engaged in major-related work within a certain number of years and carrying out numerical application based on this study. The iteration of the training curriculum system for management accounting talent ensures the dynamic and advanced nature of the training of numerically applied management accounting talent.

Fifth, iterate the teaching materials for the integration of cutting-edge technology and restore the new application business scenarios. Cutting-edge technology textbooks should achieve the organic integration of professional knowledge and application scenarios of cutting-edge digital technology. This goal can be achieved by investigating the relevant books on digital management accounting applications currently on the market edited by digital management accounting software development and consulting vendors and integrating and absorbing the latest digital technology-related theories and application status in the books, such as advanced textbooks. provides security.

4.2 Adopt a diversified and flexible teaching and examination model to promote the reform and innovation of teaching and assessment

First, the flipped classroom teaching mode was adopted. At present, colleges and universities still prioritize "crash-style" passive theory teaching, which is not conducive to improving students' independent thinking and problem-solving ability. Therefore, colleges and universities should subvert the traditional teaching model and innovate a new "student-centered" teaching model. A blend of online and offline teaching is adopted, and the teaching is carried out mainly in the form of case teaching. The cases should be able to show the application of the latest digital technology in the actual business of management accounting and simulate real business scenarios in the classroom so that students can learn more through simulation. Experience the enterprise business environment and improve its practical application ability. In addition, appropriate semester hours can be set up for sand table simulation practices in offline courses to cultivate students' business-finance integration thinking.

Second, multiple and flexible assessment methods should be developed. The multivariate assessment method is composed of two parts: procedural assessment and result-based assessment. The process assessment mainly included daily attendance, class performance, homework and group assignments, with the latter emphasizing the assessment of students' class participation and speech quality. The homework after class is mostly carried out on an individual basis, and the purpose is to master theoretical knowledge. Group homework is carried out in the form of a team, usually a case analysis presentation or a team competition, and the purpose of the group assignment is to assess the comprehensive ability of the students. The result-based assessment, that is, the final examination, can be in the form of paper-based examination, which examines the understanding and application of theoretical knowledge through case analysis; it can also take the form of computer-based examination, which examines the comprehensiveness of theoretical knowledge and practical ability of students through practical exercises. application.

4.3 Establish a "one engine, two drivers" collaborative education model and expand multidirectional channels for the convergence of resources

The coordinated education policy system should be improved to achieve the linkage and coupling of multiple subjects. The root causes of the failure of the current collaborative education mechanism to produce good results lie in the differences in the value orientation of the educators and the unclear boundaries of education responsibilities. In this regard, the government needs to play its organizational and coordinating role and formulate a sound policy for the collaborative training of numerically applied management accounting talent, such as a preferential performance appraisal system for training subjects, a funding support system for relevant scientific research projects, and an award system for excellent pilot projects, to encourage the cultivation of enthusiasm for the subject. Improve the top-level planning for the training of digital and intelligence-applied management accounting talent, clarify the responsibility boundaries of the training subjects, ensure that the training subjects each perform their duties, and promote the orderly progress of the training.

Second, the ecological construction of enterprise-school cotraining should be established, and a bridge for the mutual transfer of human resources should be built. The government provides policy support, and scientific research institutions provide intellectual support to promote the joint efforts of universities and enterprises to build a national cloud platform for management accounting personnel training. The training of digital intelligence application-oriented management accounting talent is formulated by university research teams as the mainstay, with the assistance of enterprise research departments and scientific research institutions. Enterprises and schools share platform resources, and colleges and enterprises are set as theoretical training bases and practice training bases, respectively, to promote the complementary training of enterprise further study personnel and college accounting students and to help the two-way improvement of the theoretical practice ability of current and premanagement accounting talent. In addition, enterprises can set up through trains for "excellent management accounting talent" in cooperative universities to achieve the accurate delivery of digital intelligence application-oriented management accounting talent.

4.4 To create a teacher training model of "endogenous students and external introduction" to construct a top-notch teacher team

At present, most college teachers specialize in professional theory and lack practical experience, and their understanding of digital technology is only at the theoretical level; thus, they are unable to integrate digital technology into accounting teaching. First, in response to the lack of practical experience, the "internal student and external introduction" teacher training model can be adopted, i.e., management accountants with strong digital technology application abilities can be introduced from the enterprise as practical mentors, and a periodic enterprise practical study system for on-campus teachers can be established to train on-campus teachers. Second, "Digital +" teacher training courses are set up to achieve the in-depth integration of teachers' "dual-professional skills" and "digital technology." Third, a mechanism for improving the ability of the teaching staff has been formed. Enterprise-school cooperation has implemented an embedded learning system in typical projects to guide teachers to actively participate in industry frontier forums, scientific research projects and competitions related to management accounting, to expose teachers to international frontiers of discipline, and to promote the integration of teachers' abilities and teaching innovation.

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.

Acknowledgments: The authors would like to acknowledge all the team members.

Author Statement: All authors agree with submission of this version.

Availability of data: The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Funding: This work was supported by the scientific research project for college students at Zhejiang University of Finance and Economics Dongfang College (2023dfx035).

References

Du, Y., & Deng, H. (2022). Cultivation mode and countermeasures of management accounting talents in colleges and universities based on blockchain technology. Journal of Ningbo Engineering College, 34(03), 120-125.

Zhang, R., Qian, J., & Wu, G. (2019). A case study on the training mode of accounting talents in G higher vocational colleges adapting to the smart era. Accountant, 22, 73-75.

Guo, J. (2023). Research on the integration of enterprise financial accounting and management accounting in the era of digital economy. Mall Modernization, 02, 159-161.

Liu, G., Gan, S., & Jiang, Q. et al. (2020). Application logic of management accounting digital skills based on blockchain technology. China CPA, 07, 102-106.

Li, T., & Dong, L. (2022). Analysis of Digital Management Accounting Talent Cultivation in Colleges and Universities. Management Engineer, 27(05), 38-41.

Peng, H. (2017). IMA management accounting competency framework: content analysis and evaluation. China CPA, 02, 51-55.

Ding, H. (2021). Challenges and Responses to the Training of Intelligent Accounting Talents in Colleges and Universities in the Intelligent Era. Journal of Inner Mongolia University of Finance and Economics, 19(06), 4-8.

Dai, W. (2018). Research on the innovation of applied management accounting talent training mode. Western Finance and Accounting, 07, 27-30.

Guo, S. (2022). Reform and practice of higher vocational management accounting series courses in the era of digital economy. Business Accounting, 19, 127-129.

Zhang, L., Kong, Z., & Yin, Y. (2020). "Big Data + Finance" Management Accounting Talent Cultivation and Optimization Path - Analysis Based on the Perspective of Capability Maturity Model. Journal of Finance and Accounting, 23, 158-162.

Li, W. (2013). Construction of Practice Teaching System for Applied Financial Management Majors Based on

CDIO Concept. Journal of Finance and Accounting, 11, 55-56.
Cheng, P., & Wang, J. (2018). Cultivation of Financial Intelligent Application Ability of "Internet+Accounting" Based on CDIO--Taking MPAcc Education of Chongqing Polytechnic University as an Example. Finance and Accounting Monthly, 12, 23-31.
Du, Y., & Deng, H. (2022). Cultivation mode and countermeasures of management accounting talents in colleges and universities based on blockchain technology. Journal of Ningbo Engineering College, 34(03), 120-125.
Ma, N. (2023). Research on Management Accounting Talent Cultivation Mode of Applied Undergraduate Colleges and Universities in the Context of "Great Intelligence, Mobile, Cloud and Physical Area". Journal of Chifeng College (Natural Science Edition), 39(12), 114-118.