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The relationship between information asymmetry, financial innovation and OTD bank performance

BY

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The Mediating Effect of Information Asymmetry on the Relationship Between Financial Innovation and OTD Bank Performance.

DECLARATION

I hereby declare that the research work titled “The Mediating Effect of Information Asymmetry on the Relationship Between Financial Innovation and OTD Bank Performance”. is my own work. The work has not been presented elsewhere for assessment. Where material has been used from other sources, it has been properly acknowledged. Due references have been provided on all supporting literature and resources.

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The Mediating Effect of Information Asymmetry on the Relationship Between Financial Innovation and OTD Bank Performance.

Abstract

The study analyzed the mediating effect of information asymmetry in the relationship between financial innovation and bank performance. The paper followed a quantitative approach, cross-sectional explanatory design, and survey method. The study used a questionnaire as a data collection instrument. Ethiopian private and public banks established the study population. The study used printed questionnaires to reach out to 328 survey participants. The researcher collected 267 questionnaires that qualify for farther analysis. The study employed structural equation modeling (SEM) and Smart PLS to analyze mediation effects. The result of the study indicated moral hazard plays a mediation role in the relationship between Financial Innovation and Bank Performance while adverse selection didn't. Also, all the three financial innovation forms - loan sale, loan syndication, and securitization –were indicated to have a direct link with bank performance. Such result could be related to the less expensive source of funds, risk diversification, enhanced liquidity, and expanded loan portfolio nature of the originate-to-distribute bank credit model. Thus, innovative financial mechanisms like the OTD model in banking should be introduced in Ethiopia to channel adequate funds to the private sector, create more jobs, and promote growth. Ethiopian banks should also devise techniques and enable the establishment of relevant institutions that engage in risk management and assessment to address the ex-post performance issues related to implementing the model.

Keywords: Originate-to-distribute; loan sale; loan syndication; securitization; adverse selection; moral hazard

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List of Acronyms

AB	Abay Bank
BS	Asset-Backed Security
ADIB	Addis International Bank
AIB	Awash International Bank
AQ	Asset Quality
AS	Adverse Selection
ATM	Automated Teller Machine
AVE	Average Variance Extracted
BIS	Bank for International Settlements
BOA	Bank of Abyssinia
BRB	Birhan Bank
BUIB	Bunna International Bank
CA	Capital Adequacy
CBE	Commercial Bank of Ethiopia
CBO	Cooperative Bank of Oromia
CFA	Confirmatory Factor Analysis
DB	Dashen Bank
DGB	Debub Global Bank
EB	Enat Bank
EFA	Explanatory Factor Analysis

ERMA	Electronic Recording Method of Accounting
FDI	Foreign Direct Investment
LLP	Loan Loss Provisions
GMM	Generalized Method Of Moments
HB	Hibret Bank
HOC	Higher-Order Formative Construct
HQ	Head Quarter
HTMT	Heterotrait-Monotrait Ratio
HYP	Hypothesis
KMO	Kaiser-Meyer-Olkin
LIB	Lion International Bank
LQ	Liquidity
LSA	Loan Sale
LSY	Loan Syndication
MH	Moral Hazard
NIB	Nib International Bank
NPV	Net Present Value
OIB	Oromia International Bank
OTD	Originate-to-Distribute
OTH	Originate-to-Hold
PCA	Principal Component Analysis
PROF	Profitability

ROA	Return on Asset
ROE	Return on Equity
SEC	Securitization
SEC_IB	ISLAMIC BANKS SECURITIZATION
SEM	Structural Equation Modeling
SPSS	Principal Component Analysis
SPV	special purpose vehicle
SRMR	Standardized Root Mean Square Residual
VIF	Variance inflation factors
WB	Wegagen Bank
WTO	World Trade Organization
ZB	Zemen Bank

Chapter One: Introduction

This chapter presents the background of the study, problem statement, research questions, objectives of the study, research hypothesis, significance of the study, the scope of the study, limitation of the study, and organization of the thesis.

1.1. Background of the study

A country's economic growth has been oftentimes referred to have a strong bond with its finance. Similarly, financial innovation in financial intermediaries is also oftentimes regarded as boosting or leading to higher economic growth.[1]

For nearly a hundred years the basic activity of financial intermediaries particularly the commercial banking industry has been the same. That is, they take deposits from lenders and produce loans to borrowers. However, the 1980s witnessed innovations in both banking theories and practices. Such innovations have expanded the nature of this financial institution's operation and function. [2]

The term financial innovation as defined in the world economic forum report refers to "the act of creating and then popularizing new financial instruments, technologies, institutions, markets, processes, and business models – including the new application of existing ideas in a different market context." While numerous studies are supporting financial innovation and its benefit to the financial sector and the economy as a whole, there also were some financial innovations in the financial service that altered from their intended purpose and led to a crisis.[3]

According to recent studies conducted in this area, financial innovation in the financial service sector is classified into three categories. These are new services (e.g., debit/credit card, ATM), New financial transaction processes (e.g., Cloud computing), and New organizational structures (e.g., interstate banks and diversified banks). There are various reasons for channeling innovation

[1] *(P. K. Mishra 2008)*
[2] *(Trester and Santomero 1998), (Mester 1992)*
[3] *(Oliver Wyman 2012)*

into the finance sector. Some apparent reasons are service improvement, Risk transferring, liquidity-enhancing, or equity-generating ability.[4]

Developed economies have been pioneers in exploring and adopting financial innovations in different lines of their banking financial sectors. Developing and emerging countries are also showing initiative and interest in integrating several forms of financial innovation in their institutions. According to (Ketkar and Ratha 2009) of the World Bank explain, innovative financing mechanisms are necessary for developing countries to generate employment and growth, reduce poverty, and meet the Millennium Development Goals. According to (Gitau 2011) developing countries' financial institutions like commercial banks are embracing financial innovation as a way to improve efficiency and improving bank performance. In his study, he pointed out common innovations in the banking sector and concluded that commercial banks have adopted process, product, and institutional innovation.[5]

One of the important developments in financial innovation in banking these days is the “originate to distribute” model of a bank. Financial innovation enables financial institutions to shift their investment behavior from originate-to-hold to originate-to-distribute (OTD), where the originator of a loan sells it to various third parties like institutions or investors. The OTD model is a more transaction-oriented model where banks earn fees in the process of originating the loan and diversifying the risk of the loan to various institutions/investors through transactions like loan syndication, loan sale, or securitization.[6]

A transaction like Loan Syndication on one hand is a loan where a lead bank commonly holds part of a loan and puts the remaining amount with some additional investors, which mostly are other bank institutions that are formed in agreement as part of the loan origination process. As for a loan sale, a bank originates a loan and then sells the cash stream from that loan, that is

[4] *(Leea, Wang and Ho 2020), (Chou 2007)*
[5] *(Ketkar and Ratha 2009), (Gitau 2011)*
[6] *(Lin, Rose and Dhesi 2009), (Lenhard 2011)*

without definite contractual resort, assurance, indemnity, or other credit enhancement, to the third party.[7]

On the other hand, a transaction like Securitization is when a bank transfers its mostly illiquid assets ‘e.g., a portfolio of loans’ that are generally held until maturity into marketable securities by combining these assets and marketing them to special purpose vehicle (SPV), a bankruptcy-entity that in turn finances the purchase through the issuance of debt securities to investors backed by the pool.[8]

Through such a model process of distributing originated loans there arises a key question; if banks are distributing loans they originated and simultaneously are transferring credit risk then banks are also encouraged to make large loans without appropriate monitoring and screening process. Such an advance leads to a problem of information asymmetry. Information Asymmetry was the major contributing factor in the US subprime mortgage crisis.

Information Asymmetry in the financial market leads to a financial disruption where financial markets are unable to efficiently channel funds to those who have the most productive investment opportunities. The basis for such problems which is asymmetric information is when one party often does not know all that he needs to know about another party when making a corrective decision. There are two types of risks when information asymmetry is present: Adverse selection is a risk exposure before parties enter into a transaction and Moral hazard is a risk exposure after parties entered into a transaction.[9]

In the context of the above discussion, the purpose of this study is to examine the mediating effect of information asymmetry on the relationship between financial innovation and OTD bank performance. The study will help to dig into banks regarding the outcomes of financial innovations from the aspect of information asymmetry and bank performance enhancement.

[7] *(Bord and Santos 2012), (Haubrich and Gorton 1988)*
[8] *(Casu, et al. 2013)*
[9] *(F. S. Mishkin, Anatomy of a Financial Crisis 1991)*

1.2. Statement of the problem

There has been substantial research in the area of financial innovation in the finance sector, on the ex-ante and ex-post problems arising from the OTD banking models; and on the impact, the model has on bank's performance. Studies present a different rationale for banks' adoption of the innovative and modern lending model, i.e., the originate-to-distribute model. These rationales can be sorted based on the three transaction types of the model: Loan sale, syndication, and securitization.

Under loan sale, there are several theories of the OTD model, that show banks' incentive to adopt the model. For banks that make loans, loan selling will likely provide a less expensive source of funds than the traditional deposit or equity finance. According to (Pavel and Phillis 1987), a bank may want to sell its loans to modify the diversification of its loan portfolio by selling certain types of loans in order to buy or originate other types of assets. One of the reasons for this could be to reduce monitoring costs. Other types of motives for banks to sell loans could be to fund other portions of their portfolio or to use loan sales to fund originations of similar loans, possibly achieving economies of scale.[10]

Implementing a loan syndication transaction model also comes in providing various gains to the banking sector. It serves the senior lender (bank) by inviting other banks to participate to diversify its credit risk exposure and avoid excessive exposure to a single borrower while still earning fees for origination expertise and service-related. It also enables the other banks in the syndication to participate without the cost of origination expertise and diversify their loan portfolio on loans they cannot originate themselves.[11]

The other transaction type which is securitization has also been regarded as a significant source of financing for a wide variety of assets. It is a method of financing that satisfies the needs of both the asset originator and the investor and hence will continue to grow as a financing alternative. A properly operating securitization eases the flow of credit to the real economy by

[10] *(Pavel and Phillis 1987), (Pennacchi 1988)*
[11] *(Greenbaum, Thakor and Boot 2019)*

helping banks to distribute their risk, diversify their funding, expand their loans and improve their liquidity.[12]

Besides the above-mentioned rationales, the Ethiopian banking industry might have internal and external pressure to carry out financial innovation for adopting the banking model ‘Originate-to-Distribute’. The Government of Ethiopia economic reform attempts to stress liberalization and deregulation. The Government started these reforms by first granting a license to foreign-owned companies to start business operations. Likewise, The government has also signed the African Continental Free Trade Area; resumed the WTO accession negotiations, and approved a law to introduce a capital market that was set to be launched in 2020. Such initiatives push for the liberalization of the banking sector. These reforms have a significant impact on the adoption of financial innovations by banks, which leads to assuming that regulatory reforms to be undertaken by the Ethiopian government can broadly influence latter the innovative behavior of banks and therefore may motivate banks to engage in innovative banking models like loan sale, syndication, and securitization[13].

There is also a lack of credit history and a perception by investors that investments in developing countries can be risky; so developing countries' finance sectors need innovative financing mechanisms. Innovative finance mechanisms like that of the OTD model in banking are necessary to channel funds to the private sector to generate employment and growth while reducing poverty and meeting development goals.[14]

The other thing is there have been various studies and events leading to the criticism and failure of the innovative financing mechanism regarding the originate-to-distribute model. This is mainly attributed to the weakening of lending standards because if banks increase the use of the model, then that in turn implies, they are keeping only a small portion of the loan and so the incentive to screen loan applicants properly and to monitor borrowers during the loan life diminishes. Such an advance leads to a problem of information asymmetry that will result in

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[12] (Marques and Pinto 2020), (Kronovet 1997), (Ugo, et al. 2017), (Greenbaum, Thakor and Boot 2019)
[13] *(Mehari 2020), (African Union 2019), (World Trade Organization 2020), (New Business Ethiopia 2020), (Abir and Chokri 2010)*
[14] *(Ketkar and Ratha 2009)*

adverse selection and moral hazard risk. These risks will result in a financial crisis leading to a disruption in the financial market which was witnessed in the 2008 financial crisis that was triggered by adverse selection and moral hazard problems by banks trying to use innovative financing ideas.[15]

To reduce the problem of information asymmetry one of the approaches to be taken is to use collateral backed by securitized assets because it reduces the lenders and investor's losses in the case of a default. The evidence in Ethiopia shows that the banking sector is showing initiation to implement and adopt innovations in different lines of its operations. More especially new banks that are under formation for instance "Jano Bank" are showing strong initiation to pursue the untapped market of syndicated lending and innovative financing. [16]

Given the inexperience and lack of adequate studies on the matter, the study argues that a broader mediator review and a general and independent study of the effect of financial innovations on OTD bank performance in Ethiopian banking sectors (by taking all innovations individually) are required. In doing so, Information Asymmetry (risk of adverse selection and moral hazard) has been introduced as a mediator.

The banking sector is the main pillar of fund intermediation, it thus needs to implement innovative mechanisms to get the economy moving and result in growth as stated above in different research, even if some innovations did alter from their intended purpose. This paper focuses on the readiness, position, and knowledge of the innovative transactions (Financial Innovation), with the performance of Ethiopian banks; that play a vital role in providing a less expensive source of funds, risk diversification, enhanced liquidity, and expanded loan portfolio. However, the mediating effect of information asymmetry, which is the Adverse selection and Moral hazard will also be studied to see their effect on the connection between financial innovation and bank performance.

[15] *(Bord and Santos 2012), (F. S. Mishkin, Anatomy of a Financial Crisis 1991)*
[16] *(Chen 2018), (addisbiz 2020)*

1.3. Research Questions:

- What is the effect of financial innovation on bank performance?
- What is the effect of innovative financial transactions (Loan Sale, Loan Syndication, and Securitization) on OTD bank performance?
- Does financial innovation affect information asymmetry in banking?
- Does Information Asymmetry mediate the relationship between Financial Innovation and bank performance?
- What incentives exist for banks in Ethiopia to adapt and implement the OTD banking model?
- Does bank size matter in the adoption of the OTD banking model?

1.4. The Objective of the Study

1.4.1. General Objective

The general objective of this study is to investigate the relationship between financial innovation and OTD bank performance and the mediating effect of Information Asymmetry.

1.4.2. Specific Objectives

To meet the general objective, the study focuses on the following specific objectives:

- To examine the effect of financial innovation on bank performance.
- To investigate the effect of the three innovative transaction types (Loan Sale, Loan Syndication, and Securitization) of the OTD banking Model on Bank Performance.
- To analyze the direct effect of financial innovation on information asymmetry in banking.
- To examine whether information asymmetry mediates the relationship between financial innovation and bank performance.
- To explore incentives that exist for banks in Ethiopia to adapt and implement the OTD banking model.
- To examine whether bank size matters in the adoption of the OTD banking Model.

1.5. Research Hypothesis:

The research has four main hypotheses:

H1: Financial innovation has a positive and significant effect on Bank performance

There are three sub-hypotheses and four sub-sub-hypotheses for H1

H1a: Loan Sale has a positive and significant effect on Bank performance.

H1a1: Loan Sale has a positive and significant effect on Liquidity.
H1a2: Loan Sale has a positive and significant effect on Capital Adequacy.
H1a3: Loan Sale has a positive and significant effect on Asset Quality.
H1a4: Loan Sale has a positive and significant effect on Profitability.

H1b: Loan Syndication has a positive and significant effect on Bank performance.

H1b1: Loan Syndication has a positive and significant effect on Liquidity
H1b2: Loan Syndication has a positive and significant effect on Capital Adequacy.
H1b3: Loan Syndication has a positive and significant effect on Asset Quality
H1b4: Loan Syndication has a positive and significant effect on Profitability

H1c: Securitization has a positive and significant effect on bank performance.

H1c1: Securitization has a positive and significant effect on Liquidity
H1c2: Securitization has a positive and significant effect on Capital Adequacy.
H1c3: Securitization has a positive and significant effect on Asset Quality
H1c4: Securitization has a positive and significant effect on Profitability

H2: Financial innovation has a significant and indirect effect on bank performance via information asymmetry.

There are two sub-hypotheses, three sub-sub-hypotheses, and four sub-sub-sub-HYP for H2

H2a: Adverse Selection mediates the relationship between financial innovation and Bank performance.

H2a1: Adverse Selection mediates the relationship between Loan Sale and Bank performance.

H2a1.1: Adverse Selection mediates the relationship between Loan Sale and Liquidity.

H2a1.2: Adverse Selection mediates the relationship between Loan Sale and Capital Adequacy.

H2a1.3: Adverse Selection mediates the relationship between Loan Sale and Asset Quality

H2a1.4: Adverse Selection mediates the relationship between Loan Sale and Profitability

H2a2: *Adverse Selection mediates the relationship between Loan Syndication and Bank performance*.

H2a2.1: Adverse Selection mediates the relationship between Loan Syndication and Liquidity

H2a2.2: Adverse Selection mediates the relationship between Loan Syndication and Capital Adequacy

H2a2.3: Adverse Selection mediates the relationship between Loan Syndication and Asset Quality

H2a2.4: Adverse Selection mediates the relationship between Loan Syndication and Profitability

H2a3: Adverse Selection mediates the relationship between Securitization and Bank performance.

H2a3.1: Adverse Selection mediates the relationship between Securitization and Liquidity

H2a3.2: Adverse Selection mediates the relationship between Securitization and Capital Adequacy

H2a3.3: Adverse Selection mediates the relationship between Securitization and Asset Quality

H2a3.4: Adverse Selection mediates the relationship between Securitization and Profitability

H2b: Moral Hazard mediates the relationship between financial innovation and Bank performance.

H2b1: Moral Hazard mediates the relationship between Loan Sale and Bank performance.

H2b1.1: Moral Hazard mediates the relationship between Loan Sale and Liquidity

H2b1.2: Moral Hazard mediates the relationship between Loan Sale and Capital Adequacy

H2b1.3: Moral Hazard mediates the relationship between Loan Sale and Asset Quality

H2b1.4: Moral Hazard mediates the relationship between Loan Sale and Profitability

H2b2: Moral Hazard mediates the relationship between Loan Syndication and Bank performance.

H2b2.1: Moral Hazard mediates the relationship between Loan Syndication and Liquidity

H2b2.2: Moral Hazard mediates the relationship between Loan Syndication and Capital Adequacy

H2b2.3: Moral Hazard mediates the relationship between Loan Syndication and Asset Quality

H2b2.4: Moral Hazard mediates the relationship between Loan Syndication and Profitability

H2b3: Moral Hazard mediates the relationship between Securitization and Bank performance.

H2b3.1: Moral Hazard mediates the relationship between Securitization and Liquidity

H2b3.2: Moral Hazard mediates the relationship between Securitization and Capital Adequacy

H2b3.3: Moral Hazard mediates the relationship between Securitization and Asset Quality

H2b3.4: Moral Hazard mediates the relationship between Securitization and Profitability

H3: **Financial innovation has a positive and significant effect on Information Asymmetry**

There are three sub-hypotheses and two sub-sub-hypotheses for H3

H3a: Loan Sale has a positive and significant effect on Information Asymmetry.

H3a1: Loan Sale has a positive and significant effect on Adverse Selection.

H3a2: Loan Sale has a positive and significant effect on Moral Hazard.

H3b: Loan Syndication has a positive and significant effect on Information Asymmetry.

H3b1: Loan Syndication has a positive and significant effect on Adverse Selection.

H3b2: Loan Syndication has a positive and significant effect on Moral Hazard.

H3c: Securitization has a positive and significant effect on Information Asymmetry.

H3c1: Securitization has a positive and significant effect on Adverse Selection.

H3c2: Securitization has a positive and significant effect on Moral Hazard.

H4: **Information Asymmetry has a Negative and significant effect on Bank performance**

There are four sub-hypotheses, two sub-sub-hypotheses for H4

H4a: Information Asymmetry has a negative and significant effect on Liquidity

H4a1: Adverse Selection has a negative and significant effect on Liquidity

H4a2: Moral Hazard has a negative and significant effect on Liquidity

H4b: Information Asymmetry has a negative and significant effect on Capital Adequacy

H4b1: Adverse Selection has a negative and significant effect on Capital Adequacy

H4b2: Moral Hazard has a negative and significant effect on Capital Adequacy

H4c: Information Asymmetry has a negative and significant effect on Asset Quality

H4c1: Adverse Selection has a negative and significant effect on Asset Quality

H4c2: Moral Hazard has a negative and significant effect on Asset Quality

H4d: Information Asymmetry has a negative and significant effect on Profitability

H4d1: Adverse Selection has a negative and significant effect on Profitability

H4d2: Moral Hazard has a negative and significant effect on Profitability

1.6. Significance of the Study

Since Ethiopia is one of the fastest-developing countries in Africa, there is a need for huge financial capacity to go on in increasing the development in the country. And so, this paper tries to address a range of theoretical issues in the implementation of the model in Ethiopia. It will try to show financial institutions the benefit of introducing this model in light of unlocking liquidity crunch and distribution of risk associated with lending.

This study is beneficial in three ways. First, the study introduces a new way of financing for banks in Ethiopia and so tests the model efficiency regarding bank performance and what type of incentive exists for banks from the potential introduction and implementation of the model. Second, this study can help minimize the potential financial disruption that possibly can be caused by the introduction of the innovative credit financing model by banks in Ethiopia by addressing strategies that can help mitigate the cause of information asymmetry. Third, the "OTD model" also creates an investment opportunity for the investor and so this paper is significant in a way of contributing to the practice by adding new information on the current investment pool that investors can participate in.

1.7. Scope of the Study

The conceptual scope of this study is concerned with the mediating effect information asymmetry has on the relationship between financial innovation and bank performance. The study is restricted to the interaction of Banking service providers only in Ethiopia. The study covered all commercial banks that are currently in operation as listed in the National bank directory[17]. The geographical area the study concentrated on was in Addis Ababa to target the financial institute's head offices. chief officers, directors, senior managers, managers and senior officers that were currently employed in the head offices were targeted and sampled for their views and opinions on the mediating effect information asymmetry has on financial innovation and bank performance. Financial innovation was taken as the independent variable, encompassing Loan Sale, Loan Syndication, and Securitization; Information asymmetry as a mediating variable, encompassing Adverse Selection and Moral Hazard; and Bank performance was taken as the dependent variable and was measured with Liquidity, Capital Adequacy, Asset Quality, and Profitability.

1.8. Organization of the Paper

The rest of the paper is organized as follows: The Second Chapter reviews the literature from relevant textbooks, journals, websites, and other referenced sources. The Third Chapter depicts the research methodology, it mainly deals with a description and sources of the data, and a definition of the variables including the methodology employed, sample size, sampling procedure, data presentation, and analysis used in the study. The Fourth Chapter discusses the

[17] *(National Bank of Ethiopia 2021)*

result of the analysis of the collected data and finally, The Last Chapter discussed the summary and conclusions drowns from the study, recommendations, and suggestions for future research.

Chapter Two: Literature Review

This chapter begins with a discussion of concepts, definitions, and background of financial innovation and follows its discussion with concepts, definitions, and components of the OTD bank model. Further, this section presents the innovative financial system of the OTD model and the problem of moral hazard and adverse selection that exist within each transaction type. Finally, the chapter comes up with a conceptual model (framework) depicting the relationship between variables under the study.

2.1. Theoretical Concept

2.1.1. Financial innovation in banking

The term financial innovation in financial sectors alludes to the way of inventing a new class of financial products, modifying current products, or joining qualities of various products, as a result of making financial intermediates more productive[18]. Financial innovation is a vital process that can be taken by banks to enhance growth by improving service, sharing risk, and allocating funds efficiently.[19]

Significant research in the area of Financial Innovation shows that the reasons for it are varied. The most commonly expressed motive for banks is risk reduction. This has led to an expansion in the banking sector's ability to spread risk either in reducing credit risk that exists in a particular financial instrument or otherwise by enabling the holder to protect against a certain risk while increasing the range of financial transactions by creating vast access of finance for the economy. Another common motive is cost reduction, as banks become innovative in their operations, they will start cutting down costs in terms of transactions, research, or marketing cost. Such a desire can be to reduce agency cost that is caused by asymmetric information.

[18] *(P. K. Mishra 2008)*
[19] *(Leea, Wang and Ho 2020)*

Service improvement is one of the other benefits of financial innovation in banking. Through innovation, banks can complete incomplete markets.[20]

The Historical background of financial innovation started in the early civilization of Mesopotamian that serve as a hub for financial innovation. In this period society practiced the barter trade system, in which individuals trade by exchanging goods for other goods that are thought to be proportional in value. After some length of time, the concept of commodity money was coined in the earliest 3000 BC. This allowed the society to acquire products using materials, such as gold, precious metals, and cowry shells that are thought to have a high value. This potential to transact laid a great foundation for finance as it helped advance the most primitive mode of financial arrangements and personal loans. Through time, more sophisticated financial transaction types emerged and banking institutions were developed leading to the innovation of bank deposits and banker's acceptance.[21]

From the perspective of the effect on the sector, innovation can be radical (breakthrough), revolutionary or incremental. Radical innovation in the banking sector involves a very high level of risk and reward and they are also known to be immanently unpredictable. The drawback of this kind of innovation is their nature of unpredictability, in a sense, they are not easily controlled and certainly known on the return they make. An example of such kind of innovation in the banking sector and one of the well-known innovations that changed the playing ground for many banking institutions happened in the 1950s with the introduction of ERMA (Electronic Recording Method of Accounting) by Bank of America. This innovation brought central accounting as the default mode of operations globally. Revolutionary innovations are less risky but also have less upside. They enhance the concept of what they replace and so become a default choice for a crucial share of the market. Incremental innovation which is also known as continuous innovation takes a well-known matter and makes a minor improvement that can yield

[20] *(Arnaboldi and Rossignoli 2015)*
[21] *(Arthur 2017)*

a positive payback. This kind of innovation is very low-risk, small, and unobservable outside the banking industry.[22]

Financial Innovation is something advanced that minimizes cost, reduces risk, or presents an improved product/service. There are three types of Innovation in the finance sector. The first product/service innovation deals with the introduction of new or modified financial services. Mortgage loan innovation was a great deal of innovation in this product innovation category. Service-wise innovation that is currently being adopted through the sector focus on strengthening account access and advanced way of payment that highly meets consumer demands. For these ATMs, Online banking and prepaid/debit cards are some of the renowned service innovations that immensely enhanced bank account access and allowed users to originate payment. The second innovation which is the 'New Financial Transaction Process' innovation is a new business process that leads the bank sector to increased efficiency and market expansion. Such process innovations are highly related to technological progress and include, for instance, management software that can be used with keeping clients' data and a credit risk evaluation technique that can improve loan portfolios. The 'New organizational structure' which is the third financial innovation classification deal with change in the structure, organization, and legal form of a banking institution that is caused by an innovative financial system change. An example of this type of innovation that resulted in a new organizational structure is an internet-only bank that operated in both U.S. and Europe in the mid-year 2002.[23]

Financial innovation is said to push banks into productivity and positively impact banks' operations and efficiency. The concept of financial innovation in the credit market makes financial institutions change their investment behavior from the traditional relationship banking model to a more transaction-oriented model, i.e., the originate-to-distribute model. This model is where a bank originates loans and distribute that loan to third parties. Traditionally, to provide loans banks use deposits that they keep in their balance sheet, but now with the adoption of this innovative model banks fund loans only to fully or partly distribute them in the market. This

[22] *(Gardner 2009)*
[23] *(White and Frame 2009), (Akello 2011), (Heidhues and Schrieder 1995)*

transaction-oriented model involves three innovative mechanisms under its structure for originating and distributing credit. These mechanisms are Loan Sale, Loan Syndication, and Securitization.[24]

Loan Sale

A broad body of literature on Loan sale primarily address the question of why the market exists. According to this study, the drive for this market is compatible with the explanation for financial innovation. Banks around the globe have pursued increasing the modification of their conventional domestic assets. It was late in the 1980s when the Loan sale market took off. By the end of those years, commercial and industrial loan sales reached over $250 billion.[25]

Loan sale is a mechanism that allows banks to transfer loans in part or in entire from their balance sheet to those of other institutions either with or without recourse. In doing that loan sales are known to be used in transferring credit risk from one party to another. As mentioned by many scholars in this area, loan selling allows banks to reduce credit risk which helps them gain flexibility in their lending relationships, benefiting borrowers to get loans continuously. They are also considered as Liquidity-enhancing innovations as proposed by (BIS 1986) in their classification scheme for innovations. In this market, the loans sold are generally agreements of domestic commercial borrowers. The bank in this process earns an origination fee and attempts to retain some part of the spread. According to several works that focus on loan sale as an active credit risk management tool, they suggest that banks may want to sell their loans to adjust the diversification of their loan holding which is laying off certain types of loans in exchange for originating other types of assets (***Diversification Hypothesis***).[26]

Loan Syndication

Loan syndication is a modern way of financing where various banks originate loans as one to a particular borrower. This type of financing that constitutes features of both commercial and investment banking is considered as being a mix of 'transaction-oriented' and 'relationship-

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[24] *(Beck 2016), (Leea, Wang and Ho 2020), (Lin, Rose and Dhesi 2009), (Chen 2018), (Lenhard 2011)*
[25] *(Bedendo and Bruno 2009), (Gorton and Pennacchi 1995)*
[26] *(Demsetz 2000), (BIS 1986), (Bedendo and Bruno 2009), (Steven Drucker 2007)*

oriented' loan structures by Boot and Thakor (2000). Loan syndication has shown a great increase in its market in 1997 reaching a volume of $1 Trillion, resulting in a 20% rate increase from the past decade's volume. In this debt category, commercial banks are primary originators but finance institutes like insurance companies and investment banks have also taken the role of active originators. [27]

In Loan syndication, even though a single loan is made to the borrower, each bank that participates in the syndicating process is a direct lender to the borrower with each bank's claims certified in a separate note. In this process, one bank will act as the managing agent (lead arranger) for the group by negotiating loan agreements and then organizing the documentation needed for the process. The lead bank is also responsible for closing the loan, funding loan advances, and administrating repayments. The managing bank will receive service fees from the borrower for the administration. Through loan syndication, lenders can provide debt facilities that are outside their risk-exposure level by spreading the risk across various lenders in financing a project. Their return from the financing is proportionate to the level of risk a bank underwrites. The costs involved in putting up a syndicated loan involve management fees, structuring fees, participation fees, agency fees, commitment fees, underwriting fees, front-end fees, and also interest fees. [28]

Even though banks don't have a relationship with a borrower or don't have specialized knowledge or a good customer base in a particular sector they can through loan syndication attract quality businesses by participating in syndication with other big banks that have sector-specific knowledge and good customer base or have a good relationship. Regarding capital adequacy, the Basel agreement requires banks to hold minimum capital adequacy to give protection for depositors so that banks will not become over-committed to a particular project. Participating in syndication once again will ensure that banks maintain the required capital adequacy ratios. Concerning profitability taking part in loan syndication involves earning fee

[27] (Simons 1993), (Boot and Thakor 2000)

[28] (Dennis and Mullineaux 2000), (Simons 1993), (Independent Development Evaluation: African Development Bank 2021),

incomes and interest margins. These fee incomes that are regarded as off-balance sheet earnings increase the all-in-all profitability of the proceedings ROA (return on asset) of the participants.[29]

Securitization

The other modern way of financing which is securitization is the practice of combining diverse types of contractual obligations (loans) which have been the bread and butter of banking institutions and selling their related income as tradable securities to a range of third-party investors. This financing mechanism that was invented in the early 1970s had an outstanding $1.9 trillion in securitized securities by the end of 1994 and a greater than $500 billion securitization was finalized. By 2001 there was over $2.5 trillion value of outstanding securities. The securitization market globally is dominated by the US with the value of securitized assets rising to $11 trillion in 2011. Bank of America was the first bank to issue private-sector-pass-through financed by conventional mortgages in 1977.[30]

This innovative financing is often referred to as the Asset-backed securities market. Some of the assets that are currently being securitized are mortgages, automobile loans, commercial truck loans, credit card receivables, and boat loans. Securitization permits this asset to be sold for a price that goes into the bank's profit line by raising the return on equity (ROE) without affecting the balance sheet. A bank’s role in the process of securitizing assets involves various specialized functions. The major roles in this process are issuer, underwriter, rating agency, servicer, and trustee. The *issuer* which is a bank that originates a loan integrates the asset held as collateral for asset-backed security. These assets that the bank pools together are then sold to a *special-purpose vehicle* (SPV) which is a separate legal entity. This *SPV* initially issues security tranches and uses the fund from buyers of these tranches to buy the assets from the issuing bank. In many cases, this *SPV* passes on these assets to a second special-purpose entity, commonly a trust.

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[29] (Fight 2004)

[30] (Gandhi 14 July 2015), (Kara, Ozkan and Altunbas 2016), (Lupica 2001), (Hill 1996), (Morcos and Zalecki 2006), (Greenbaum, Thakor and Boot 2019)

The other role carried out in the securitization process is the *servicer*, which oversees the processing of payments and relation with borrowers, imposes collection standards authorized by the pooling and servicing contract, and as required facilitates liquidation of the collateral in the matter of default. The issuer (banks) would maintain these servicing rights if it lent the underlying assets. All in all, servicers function as managing payment flows and maintaining administrative support to the trustee. *The trustee* is a separate company that has a fiduciary obligation for monitoring the SPV and promoting the investors' interests. The trustee's principal responsibility is to distribute payouts to investors and to manage the security on their behalf by gathering data from the servicer and issuer and evaluating the underlying collateral's performance. *The underwriter*, which is another role carried out in the securitization process represents the issuer. They are primarily engaged in examining investor demand and outlining the arrangements of the security tranche. Underwrites roles also involve buying a certain offer at a lower price before dealing with an investor. This function of underwriters can be generalized as marketing and selling securities. In addition, in the secondary marketplace, underwriters contribute to liquidity support. Because asset-backed instruments are sold over the counter, underwriters' readiness to act as broker-dealers by keeping an inventory and developing a market helps to speed up the issuance process. Further, *Rating Agencies* play a crucial part in this securitization process. They provide authentication services to investors that need to undertake a careful examination of the underlying assets and assess the security structure. [31]

2.1.2. **Benefit of the OTD Banking Model**

Regulatory capital constraints and the difficulty of raising external capital may prevent a bank from lending up to the best-case scenario. As a market reaction to these frictions, financial innovations emerge naturally. Some of these frictions were addressed by the originate-to-distribute (OTD) lending model, in which the loan originator distributes the loan to third parties.

[31] (Greenbaum, Thakor and Boot 2019), (Blundell-Wignall, Atkinson and Roulet 2018), (Cetorelli and Peristiani 2012)

This model enables the originating financial institution to effectively share risk with the broader economy, cut back on regulatory capital, and manage liquidity risk. [32]

The OTD model's benefits come at a price. As the credit model moves from originate-to-hold to originate-to-distribute, the originating banks' screening and monitoring incentives get influenced. [33]

2.1.3. **Information asymmetry**

While there are various grounds for banks to engage in innovative pursuits, the effect of information asymmetry appears to have a role in banks' innovative engagement. Information asymmetry in the financial market as defined by (Mishkin, Matthews, and Giuliodori 2013) is the inequality of information when one party does not have sufficient information about the other party to make a reliable decision. Inequality of information in the financial market creates problems in two ways, before and after a transaction is entered. The collection of information about applicants and the screening of creditworthy borrowers from non-creditworthy borrowers is one of the most basic functions of banks. The majority of this data is gathered during the lending process and the subsequent monitoring function, which is frequently regarded as a defining feature of bank finance. Information asymmetry in credit markets, on the other hand, lies at the heart of financial inefficiency, economic turmoil, and subsequently bank failures. The two main problems of information asymmetry between participants in this credit mechanism are the problem of moral hazard and adverse selection. [34]

Due to the prevalence of asymmetric information, the so-called originate-to-distribute model has been accused of fueling financial excesses and precipitating the financial crisis. Because banks rely largely on non-verifiable soft data on borrowers, the ability to off-load credit risk via credit distribution may impair banks' incentives to screen borrowers at origination or to continue monitoring them after the loan is sold, resulting in adverse selection and moral hazard.

[32] (Stein 1998), (Allena and Carletti 2006), (Drucker and Puri 2006), (Allen and Gale. 1994)

[33] (Gorton and Pennacchi 1995), (Pennacchi 1988), (Purnanandam 2010)

[34] *(Steven Drucker 2007)*

Adverse Selection and the classic "lemons" problem

The theory of adverse selection aside from the financial market has been described in various fields such as biological science (Zeh, Zeh and Bermingham 1997), gambling (Chezum and Wimmer 2000), labor market (Greenwald 1986), and the most known used cars market (Akerlof 1970). The highly regarded 1970 paper "The Market for Lemons: Quality Uncertainty and the Market Mechanism" by economist George Akerlof explores how the quality of trades in a market might decrease in the existence of information asymmetry between market participants, leaving only "lemons" hanging. The lemons problem in this respect also depicts adverse selection, a condition in which less suitable economic agents are more inclined to engage in commercial activity since the information to assess the genuine quality of the trade is insufficient[35].

Let's assume there are two market players, a seller and a buyer of a used car, who both need to reach a decision. The seller of the automobile knows whether it is a good car or a bad car (a lemon); but on the other side, the buyer knows nothing about the quality of the used car and only has a general sense of the probability distribution of good and bad cars. Symmetric information hinders the market from achieving Pareto optimality in this regard. Adverse selection is demonstrated in the context of the Lemons phenomenon by market agents who are unable to assess the degree of quality of the desired product. As a result, there exist used cars of varied grades and real monetary values that are all within a certain price range[36].

In the loan market, a lemons problem arises when lenders have difficulty assessing whether a borrower is a good risk (has attractive investment prospects with minimal risk) or a bad risk (has poor investment prospects with significant risk). If the lender is unable to differentiate between good and bad borrowers (lemons), he will only provide credit at an interest rate that mirrors the average quality of the good and bad borrowers. As a result, high-quality borrowers will pay a higher interest rate than they should, while low-quality borrowers will pay a lower interest rate as

[35] (Akerlof 1970), (Nyoni 2018)

[36] (F. S. Mishkin, Asymmetric information and financial crises: a historical perspective 1990)

a result of the lemons problem, some high-quality borrowers may opt out of the market, resulting in the termination of potential successful investment projects.[37]

In the Originate-to-distribute model individual investors and financial institutions participate in financing banks, which the bank subsequently uses to lend to borrowers. Based on the sort of obligation the bank creates to fund itself, this will or will not result in an adverse-selection problem, preventing the lender from making positive NPV loans. When the bank can finance itself entirely with insured deposits, an adverse-selection problem doesn't exist, and lending behavior is unaffected. However, if a lender's capacity to create insured deposits is limited, it will have to turn to non-insured sources of funding, which will result in adverse selection and a change in lending behavior[38].

Adverse selection, which is also a problem of hidden information is rooted in the OTD model when lenders through screening loan applications obtain soft and hard information and use that information to decide the quality of loans to sell to investors. According to prevailing wisdom, lenders may know more about a borrower's credit quality than what is indicated in the hard data obtained, such as the borrower's credit score, income, and debt payments. Lenders may be enticed to use their unobservable private information about borrowers to keep higher-quality loans on their balance sheets while offering loans of lower quality, thus the distance between the lender and the risk holder increases, resulting in loan officers screening (ex-ante) incentive to collect soft information decrease. [39]

The term "adverse selection" alludes to the circumstance of information asymmetry before an agreement, which may occur if issuers take use of their private soft information. In this situation, issuers opt to distribute bad loans as if they were good ones. According to the theory of adverse selection, a lemon market occurs when investors' best prediction for a specific asset in the credit market is of average quality due to the potential of private knowledge. Investors with

[37] Ibid

[38] (Stein 1998)

[39] (Agarwal, Chang and Yavas 2012), (Purnanandam 2010)

little knowledge would be hesitant to pay a high price in this instance. Lenders, on the other hand, would be hesitant to offer their high-quality loans on the open market. This consequence might result in a market-level bank risk since the asset quality as a whole could degrade to the point where the market would cease to function.[40]

Because rational investors assume that the lender (bank) has an informational advantage when evaluating the creditworthiness of loans, rational investors expect the loan originator to mislead them about the true value of the credit quality of the reference portfolio. As a result, similar to the lemon dilemma, the originator will face an adverse selection premium when selling their high-quality assets if the market is unable to distinguish between high-quality and low-quality assets. In other words, in exchange for the uncertainty regarding the true value of the underlying portfolio, investors will seek a discount on the ABS price.[41]

In conclusion, Lenders that associate themselves with the Originate-to-Distribute banking model had lower screening incentives that result in very low-quality loans with immoderate poor soft information being originated by these banks. From another perspective, these banks' superior information about their borrower brings around concern about distributing loans on which they have unobservable (negative private) information.

Moral Hazard and the principal-agent problem

Going back early to the static model of the 1970s, the principal-agent problem of moral hazard has a tremendous ample history. The insurer-insured relationship in the insurance sector gave rise to the phrase "moral hazard" and Arrow is thought to have presented the first rigorous economic analysis of moral hazard (Arrow 1963), (Arrow 1965)[42].

The principal-agent problem exacerbates when separation of ownership and control exists. (Berle and Means 1932) book - ‘The Modern Corporation and Private Property’ - which highly is

[40] (Chen 2018)

[41] (Jobst 2002), (Akerlof 1970), (Morcos and Zalecki 2006)

[42] (Santibanez, Possamai and Zhou 2019), (Dutta and Radner 1994)

regarded as “the birth of contemporary corporate governance” and still makes an influence on present-day corporations of the 21st century points up the idea that separation of ownership and control is the distinguishing characteristic of modern public companies. These outline that present-day companies are exposed to principal-agent problems which also are recalled by (Jensen and Meckling 1976). The underlying explanation is that in modern corporations’ managers are in charge of deciding how a company's funds are used, how its resources are allotted, and what projects it pursues, but then again, these managers don't own the capital or the resources. The main tenet of their theory is that capital was very concentrated in the economy and as a result, certain companies become very influential. When these companies kept growing it became very laborious for original owners to sustain their considerable shareholdings and so shares became distributed through many small shareholders. As (Berle and Means 1932) indicated, this is a result of power being in the hands of managers, who are in charge of the corporation. These executives express different motives towards shareholders. The principal-agent theory arises from the issue that agents (managers) will go after their interest and satisfy themselves as a fringe benefit whilst bearing barely a tranche of the cost. For the principal (shareholders) it’s not convenient because of time and logistics to monitor the managers as a result monitoring them will incur agency costs.[43]

Moral hazard problem attributed to the monitoring function of banks after originating a loan arises in the OTD banking model when banks after originating a loan distribute the credit risk associated with investors, as these banks monitoring incentive diminishes since the ultimate bearer of the risk are no longer the originators. (Bhattacharya and Thakor 1993) paper; Contemporary banking theory points outs that screening and monitoring are the core expertise of banks. A decrease in such core activity of a bank will result in a depletion of value creation and fundamentally affect the profits of these institutions.[44]

Various scholars in the field of financial markets attribute the case of the 2008 global crisis to be because of the OTD model and the principal-agent problem attached to it. The reason being

[43] (Lui 2011), (Busato and Coletta 2017)

[44] (Ahn and Breton 2014)

banks that originate a loan for borrowers are no longer solicitous about the characteristics of the borrower. When these banks exercise insufficient skin in the game, their motive gets altered, resulting in the deliberate sale of poor-grade loans as well as lax monitoring. The monitoring function of banks has two effects: one it increases the success probability of loans, and two by further monitoring the behavior of borrowers, the bank learns its type.[45]

The difference between adverse selection and moral hazard is that in adverse selection it is thought that the principal is not aware of certain significant features of the agent even though the principal is capable of perceiving the agent's activity while in moral hazard the principal is presumed to be aware of all significant features of the agent that is to know the agent's type, but is not aware of -or chooses not to be aware of – what action the agent chooses.[46]

2.1.4. **Bank Performance**

The Concept of Bank Performance

Performance is defined as the attainment of the firm's (the bank's) objectives within the agreed-upon time frame and at the lowest possible cost while utilizing the available resources. For a manager, performance may be defined as profitability or competitiveness for the firm while for the employee, the working conditions, or the quality of services offered to customers.[47]

In recent years, the banking sector's performance has garnered a great deal of attention. In general, studies conducted have primarily used one of two approaches: the dealership approach or the firm theoretic method approach. Proposed by (Ho and Saunders 1981) and expanded by (McShane and Sharpe 1985), (L. Allen 1988), and (Angbazo 1997), the dealership approach observes banks as dynamic dealers, laying interest rates on loans and deposits to maintain the asymmetric entry of loan demands and deposit supplies while the firm theoretic approach that was established by (M. Klein 1971) and (Monti 1972) regards banking businesses as being in a

[45] (Vieira 2017), (Ahn and Breton 2014)

[46] (Dutta and Radner 1994)

[47] (Hajer and Anis 2016)

static environment where demand and supply of deposits and loans, respectively clear both markets at the same time.

There is currently a considerable body of research that examines the role of resource management in determining bank performance. It is widely acknowledged that effective resource management is the most important element influencing bank performance.[48]

It is to the shareholder's greatest advantage to boost banks' profits since they are entitled to their earnings. They could do that by increasing revenue while lowering costs. In addition, based on the bank's market strength in the input and output markets, they could be able to raise or lower output or input prices respectively. Profit maximization is identical to cost reduction in a perfectly competitive environment, according to economic theory. In practice, however, profit maximization and/or cost reduction are not always followed. Because of imperfect competition, profits are optimized at a level of output where average costs are not reduced. A second reason why shareholders may refrain from maximizing predicted earnings and lowering costs is that their risk tolerance is different. Highly risk-averse and under-diversified shareholders will want to guarantee that their bank performs counter-cyclically, forcing them to make decisions that aren't always the best for the bank.[49]

The separation of ownership and control, which is more easily expressed in banking practice, lies at the heart of incentive problems that are - ceteris paribus – irrespective of market structure. The principal-agent theory implies that in the absence of complete information, shareholders' inability to appropriately monitor bank management and the resultant managerial discretion may result in non-optimal behavior, which is, earnings are not maximized and/or costs are not reduced. Bank management may demonstrate expense-preference behavior or – if it is particularly risk-averse – any other technique that decreases profits as long as shareholders cannot guarantee themselves against this probable suboptimal conduct. Asymmetric information between principal and agent that (Diamond 1984) used to explain why banks exist is now

[48] (Sufian and Noor 2012)

[49] (Bikker and Bos 2008)

helping to explain why banks themselves might struggle from moral hazard and other incentive problems.[50]

Few works have sought to examine the influence of principal–agent conflicts on bank performance. Hidden action by or hidden knowledge of banking supervision leads in lower performance of banks, are less practically investigated. Moral hazard issues in the principal–agent relationship is problematic if the principal (i.e., the shareholder) is unable to protect himself against the agent's extreme risk taking (Tirole 1993). while incentive concerns cause a bank's performance to be suboptimal, the degree to which this has an impact on banking dynamics is unknown.

Measurement of Bank Performance

Performance measurement, like any other control and management function, is a tool to direct and inspire the action of an organization's players. Progress can't happen until there is a mechanism to collect performance feedback, because measuring is the first step toward improvement. There are mainly two kinds of bank performance measurement. The first is a measurement that pertains to the operation's outcomes, while the second is a financial measure. The first type of measurement focuses on the non-financial factors of results, such as resource usage, flexibility, innovation, and quality. This specifies that measurement may be constructed around the notions of outcomes and determinants as aspects of performance. As regard to financial type of measures, scholars have noticed a shift in performance models based on financial metrics. As a result, several studies have measured bank performance using cost-efficiency and profitability ratios (ROA, ROE).[51]

Asset Quality

Although asset quality is vital for all businesses, it is especially so for banks, which is essential aspect of financial markets and the appropriate functioning of banking activities, financial system and, as a result, the national economy. Asset quality in banks is associated with the

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[50] ibid

[51] (Kadioglu, Telceken and Ocal 2017)

quality of loans issued by the bank, and loan quality is assessed by nonperforming loans (NPLs), which include outstanding loans and follow-up loans[52].

According to (Bernanke, Lown and Friedman 1991), in countries with bank-based financial systems, lower asset quality, also known as the "credit crunch", could potentially delay economic recovery by reducing operating profit margins or depleting capital base for new loans. According to (N. Klein 2013), poor asset quality will affect bank profitability, which is primary source of profit, and eventually the economy's financial stability. Bankruptcies and economic slowdown could also potentially result from poor asset quality. Given that lower quality assets, also known as toxic assets, were one of the main causes of the global financial crisis in 2008, measuring lower asset quality loans by thoroughly assessing their impacts, and formulating the necessary economic policies are critical for the entire economy and also financial institutions themselves. (Demirguc-Kunt 1989); (Whalen 1991); (Barr and Siems 1994); (Berger and DeYoung 1997); (Adhikary 2006).

According to (Nagle 1991), the issue of asset quality could become a "future time bomb for banks". (Khalid 2012) investigated this in an empirical study based on Indian private banks and proved it to be right. One of the key reasons of the Asian Finance Crisis in the early 1990s, according to (Yin 1999), was the worsening of asset quality due to banks' ignorance of loan quality.

From the 25 fundamental principles set out by the Basel Committee on banking supervision, 7 of them are associated to banks asset quality and loan risk management; indicating that asset quality has become a significant issue for supervision authorities around the world.[53]

Liquidity

Liquidity performance measures a bank's ability to meet financial commitments as they become due, and it's critical to the institution's long-term sustainability. The quick liquidity ratio, referred

[52] ibid

[53] (Abata 2014), (Kadioglu, Telceken and Ocal 2017)

to as the acid-test ratio, refines the current ratio by determining the amount of most liquid current assets available to satisfy current obligations. It is critical to an organization since they must try and get rid of inventory and find buyers for it. The major purpose of banking, according to (Waemustafa and Sukri 2016), has remained unaltered throughout the history of banking theory. Banking's basic job remains risk, asset, and liability management. The volatility of liquidity risk can be used to detect early signs of a financial crisis. [54]

The bank's sensitivity to external deposit withdrawals or bank panic shocks is reduced in an environment that promotes asset liquidity. As a result, it promotes the bank to dedicate a larger portion of its portfolio to risky assets. Hence, their ability to provide critical risk financing to the entrepreneurial sector is indisputably increased. Nevertheless, when these assets perform badly, the bank's performance is more adversely affected than it would be if risky asset ownership was prohibited.[55]

Capital Adequacy

A bank's or other financial institution's capital adequacy is the amount of capital it must have in order to meet its financial regulator's requirements. These requirements provide an appropriate protection of equity during weak economic cycles, as well as a tool to restrict excessive risk-taking, in order to prevent bank collapse and maintain financial system stability. This is commonly represented as a capital adequacy ratio, which is the percentage of risk-weighted assets that must be kept in the form of equity. These standards have been developed to keep financial organizations from taking on too much debt and going bankrupt. On the assets side of a firm 's balance sheet, capital requirements determine the equity-to-debt ratio.[56]

Unlike the traditional method (OTH) in the OTD Model financial regulators require that the asset be kept on the bank's books for capital adequacy assessments and that the sale be recognized as a deposit and so reservable. Through the transfer of debts to an off-balance sheet item, the OTD

[54] (Ibrahim 2018)

[55] (Trester and Santomero 1998)

[56] (Velliscig, Floreani and Polato1 2022), (Pradhan and Shrestha 2017)

Model allows banks to better meet Basel II capital adequacy regulations. As a result, banks can get around Basel II's adequate capital ratio, which restricts the quantity of outstanding loans in relation to equity capital. Banks could potentially be able to raise capital adequacy ratios without reducing the risk of their loan portfolios. [57]

Profitability

One way to evaluate a bank's performance is to look at its profitability. For a bank to survive and thrive, it must be profitable. Bank profitability is a key variable of bank performance since it indicates the rate of return a bank has earned from the resources at its disposal in order to produce and sell services. Banks earn a profit when they raise more income than they spend on expenditures. The majority of a bank's profit comes from service fees charged for its services and interest generated on its assets. The interest on its liabilities is its most significant expenditure. Bank profitability's influence in the economy may be measured at both the micro and macro levels. Profit, at the micro level, is not only an outcome but a necessary requirement for a competitive financial institution. As a result, the primary goal of a bank's management is to maximize profits, which is a necessary condition for operating any company. A business organization's existence, success, and sustainability are largely determined by the amount of profit it can generate. At the macro level, a profitable financial sector is better equipped to withstand negative shocks and provide support to the financial system's stability.[58]

Financial innovations are mainly concerned with raising profits for the business and take the shape of new products, as well as changed practices and procedures targeted at increasing shareholder value. By adopting the OTD model, banks could find a way to lower their cost of funding and also be able to diversify interest income and expense. The bank can lower credit risk

[57] (Pavel and Phillis 1987), (Abdelsalam, et al. 2020), (Kara, Ozkan and Altunbas 2016), (Dowd 1999)

[58] (Yuanita 2019), (Menicucci and Paolucci 2016)

and maximize loan provision, profitability, and liquidity by alienating the source of funding from the bank.[59]

[59] (Office of the Comptroller of the Currency 1997), (Rosenthal and Ocampo 1988), (Gundoğdu and Taşkin 2017), (Mokatsanyane, Muzindutsi and Viljoen 2017)

2.2. Empirical Literature

Table 1 Empirical Literature Review

Author(s), date	**Focus of study**	**Methodology and adopted model**	**Key findings**
(Berndt and Gupta 2009)	To examine at how a large sample of borrowers in the syndicated loan market are affected by the shift in bank lending from the relationship banking model to the "Originate-to-distribute" model.	Regression analysis Calendar-time analysis Event-time approach	Results suggest that banks are either generating and selling loans to lower-quality borrowers based on unobservable private information (adverse selection), or loan sales result in lower bank monitoring, which negatively impacts borrowers (moral hazard).
(Keys, et al. 2011)	To explore empirically if securitization has an adverse effect on banks' ex-ante screening activities.	Regression discontinuity	Results suggest that securitization does adversely affect the screening incentives of lenders.
(Dennis and Mullineaux 2000)	To investigate the variables that affect a bank's choice to sell a loan in a syndication environment, as well as the drivers of the proportion of a loan that will be sold if a decision to syndicate is made.	Two-stage procedure model Logit estimation Truncated regression model	Empirical findings do not indicate that moral hazard is a major factor influencing the decision to syndicate a loan.
(Cai, et al. 2018)	To investigate what change in loan syndicate organizational form have an impact on price collusion, and how?	Herfindahl–Hirschman index Develop a novel measure of distance in lending expertise	They discover that lead arrangers do not maintain majority loan shares in syndicates having substantial information asymmetries in their borrower, when the syndicate length is low, which is associated with lead arrangers decreased need to communicate credit quality or minimize moral hazard.
(Dennis and Mullineaux 2000)	To investigate the variables that affect a bank's choice to sell a loan in a syndication environment, as well as the drivers of the proportion of a loan that will be sold if a decision to syndicate is made.	Two-stage procedure model Logit estimation Truncated regression model	Results suggest that loan syndications, like loan sales, tend to be driven in part by capital regulations, and the agent bank's liquidity position increases the likelihood of syndication but not the amount to which it occurs.

(Altunbaş and Kara 2011)	To examine the factors that influence a bank's participation in loan syndication using financial data from 847 participating banks.	Logistic regression model with a binary dependent variable Hausman test	Due to regulatory restrictions, a bank that is limited in its capital-to-asset ratio could be unwilling to reduce the ratio by taking on a sizable bilateral loan; instead, the bank might decide to syndicate a share of a loan. Their study also found that liquidity have a positive association with the probability of syndicating a loan though it was not statistically significant.
(Stuart and Thakor 1987)	To investigate whether a bank prefers to provide deposits to finance the loans it produces or market the debts to investors.		Banks maintain existing low-quality assets while securitizing their better ones, which lowers asset quality.
(Demsetz 2000)	To present evidence and test the validity of two hypothesis (i.e., comparative advantage hypothesis and diversification hypothesis) in respect to banks motive to sell loans.	A multinomial logit model	Asset quality significantly improves a bank's capacity to sell loans. Banks who lack the ability to diversify quality portfolios internally utilize loan sales;
(Pavel and Phillis 1987)	To empirically analyze the asset sale theory and predict whether a bank would sell loans continuously throughout the year, occasionally throughout the year, or never, as well as the monetary value a bank would sell	Multivariate logit models Multivariate tobit models	Loan sales enables banks to diversify their portfolios, which will increase the safety of individual banks, and to make profit originating and servicing loans rather than storing them.
(Abdelsalam, et al. 2020)	On the effect of various contractual kinds of asset securitizations on the financial stability of a multinational sample of commercial banks in 21 countries between 2003 and 2012.	Utilize a two-step generalized method of moments (GMM) dynamic (unbalanced) panel estimator	The role of securitization activities on bank financial stability was investigated in this model. The findings revealed that banks with the largest asset securitization activities have greater capital adequacy and liquidity risks. During the financial crisis, however, SEC_IB (Islamic Banks) consistently indicated superior asset quality.
(Bannier and Hansel 2006)	Insights into the use of loan securitization and influence that various firm-specific and macroeconomic factors may have on an institution's securitization decision.	Probit framework	Results suggest that loan securitization is an appropriate funding tool for banks with high risk and low liquidity.
(Mekonnen 2011)	The study investigated significant role of loan characteristics and of lending limit, liquidity, capital adequacy and concentration on	Regression model ANOVA test Multicollinearity test	Capital adequacy and concentration negatively influences the possibility of syndicate lending in Ethiopia banking industry.

	the possibility of syndicate lending on Ethiopia banking industry.		
(Loutskina 2011)	The paper analyzes the role of securitization in affecting the nature of banking.	Cross-sectional analysis Rigorous regression analysis Regulatory discontinuity analysis	Result suggested securitization allows banks to transform illiquid debts into marketable securities, hence, generates a new source of liquidity, resulting in a liquidity increase.
(Dahiya, Puri and Saunders n.d.)	On the effects of loan sales on both borrowers as well as bank stock returns.	Cross-sectional tests	No significant relationship between a bank's probability of selling a loan and its capital adequacy position and on average, loan sales appear to have had little direct (net) impact on a bank's equity return.
(Pennacchi 1988)	Analyzes a model in which banks may increase loan returns by monitoring borrowers due to a moral-hazard problem caused by banks' lower motivation to properly monitor and handle loans once they've been sold.	Simple state preference model	It was demonstrated that by constructing the loan sales contract in such a manner that the bank receives a disproportionate amount of the gains from monitoring, a bigger share of the loan may be sold and, as a result, a higher level of bank profits can be achieved.
(Wambui 2014)	To investigate the feasibility of Asset-Backed Securities in Kenya.	Exploratory research design Content analysis Descriptive and inferential statistics.	Results suggest that the market for Asset-Backed Securities in Kenya is realistic. The key advantages would be increased market liquidity, cheaper loan costs, risk dispersion, market expansion, and promotion of FDI. Other advantages include providing a better approach to manage regulatory capital while also earning income and controlling profitability. It would also improve market and operational efficiency.
(Cebenoyan and Strahan 2004)	To investigate how actively managing a bank's credit risk exposure via the loan sales market impacts capital structure, lending, profits, and risk.	A series of cross-sectional, reduced form regressions that relate measures of capital structure, investments in risky loans, profits and risk to control variables Descriptive statistics	Investigated whether loan sales activity results in lower risk and larger profits, as well as risk-adjusted earnings. Result showed that the buy-and-sell banks have much lower risk and higher profit than similar banks that do not employ loan sales to control their credit risk.
(Affinito and Tagliaferri 2010)	To investigates the ex-ante determinants of bank loan securitization on Italian individual bank data from 2000 to 2006.	Probit and logit models Tobit models Hazard model Instrumental variables (IV) regression two generalized methods of moments (GMM) estimators	Bank loan securitization is a multi-faceted choice. Banks that are undercapitalized, under profitable, under liquid, and loaded with poor quality loans are more likely to securitize early and for a bigger amount. Their empirical findings is consistent with the profitability-enhancing theory of securitization.

(Casu, et al. 2013)	To examine the impact of securitization market access on bank performance.	Univariate analysis on U.S. commercial bank data from 2001 to 2008	Findings showed that securitizing banks are more profitable organizations with a more diversified funding structure, but they also have greater funding costs and are more exposed to credit risk. In comparison to no securitizing banks, they also have larger and less diversified loan portfolios, fewer liquidity, less capital, and look to have lower loan growth.
(Ishak, Leon and Usman 2021)	To examine the effect of securitization on the financial performance of banks.	Data panel regression model	They found that banks increased their profitability by selling their loan receivable assets to the capital market in order to get liquidity. Furthermore, during the last decade, the bank's position as an intermediary among borrowers and savers has shifted dramatically. The findings indicate that asset-backed securities have a considerable positive Return on Assets. Additionally, securitization enhanced the bank's financial performance parameters such as ROA, Loan Loss Provisions (LLP), and Size.
(Mohamed, Tapas and Simon 2018)	Studied how securitization influences bank risk and profitability, and how these impacts ultimately determine the securitization's overall influence on bank stability and systemic risk.	S-score Structural model	They found that banks that participate in securitization face a trade-off between profitability and risk. The findings also demonstrate that securitization operations might explain this trade-off, since securitization boosts profitability while raising bank risk-taking.
(Bakoush, Abouarab and Wolfe 2019)	assessed the pathways via which securitization affects bank profitability.	Panel data model Structural Equations Modeling	They found banks profitability is increased through securitization operations.

2.3. Conceptual Framework

This section of the thesis establishes the conceptual framework within which the thesis was framed. This conceptual framework demonstrates the study's attempt which tries to investigate the relationship between the independent variable namely Financial Innovation (Loan Sale, Loan Syndication, and Securitization), and the dependent variable OTD Bank Performance (Asset Quality, Liquidation, Capital Adequacy, and Profitability) with a mediating role of Information Asymmetry (Adverse Selection and Moral Hazard).

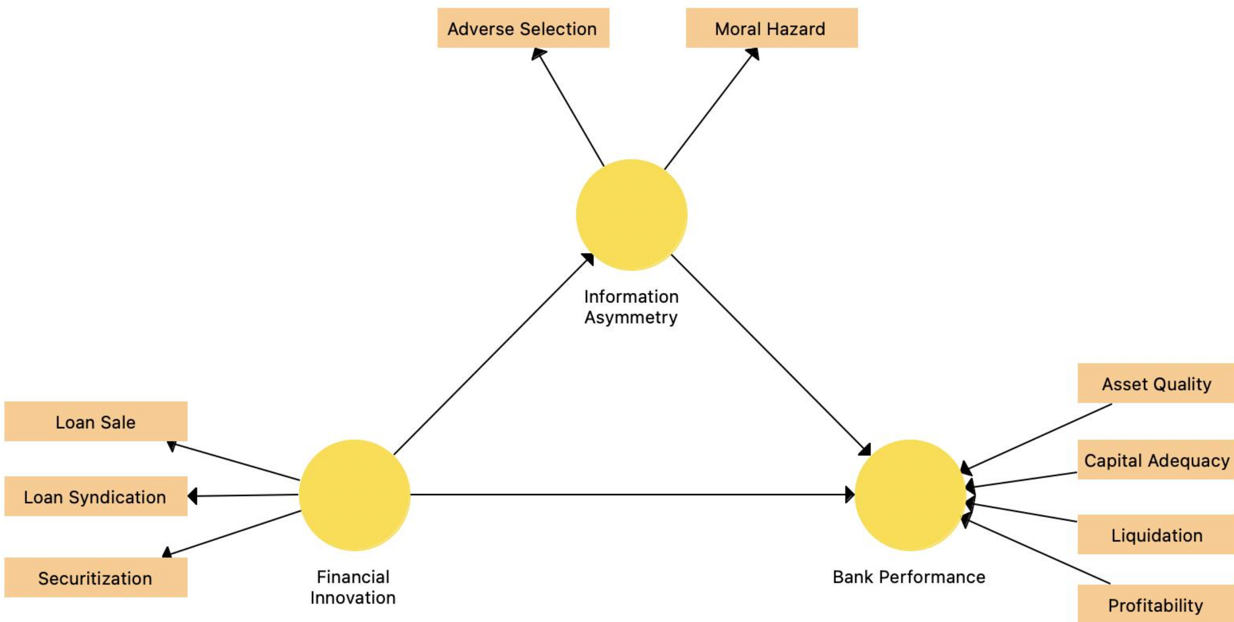

Figure 1 Reflective-Reflective and Reflective-Formative Higher Order Construct - Conceptual Model[60]

[60] Self-constructed

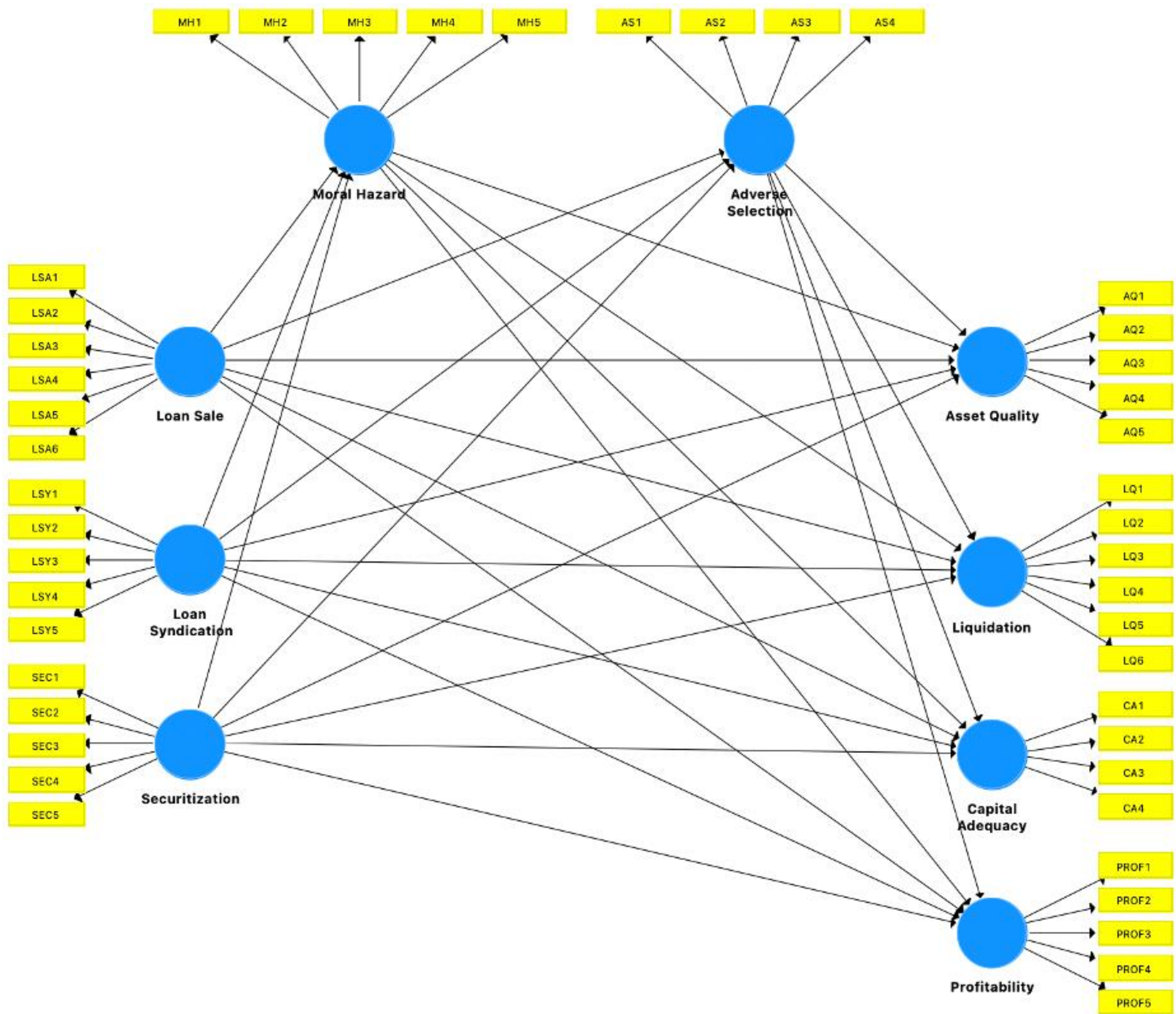

Figure 2 Lower Order Construct model[61]

[61] Self-constructed

CHAPTER THREE

RESEARCH METHODOLOGY

In the previous chapter, a review of relevant literature on financial innovation, information asymmetry, and factors that measure bank performance has been presented. The subsequent part of this chapter highlights the overall research study approach and design. It emphasizes the research design and the reason behind such selected research designs. Furthermore, it presents the overall data collection process procedures and software that were used to analyze collected data.

3.1. <u>Research Approach</u>

For educational research, there are four types of research approaches. These different approaches are; Qualitative, Quantitative, Mixed Method and advocacy/participatory approach. Qualitative research is often linked with interpretive philosophy as the researcher has to be clear of the subject and socially formed interpretations made about the study area. The term qualitative applies to the nonnumerical characterization of some object and leans more on principles from interpretive view and states expression of cases and contexts. This approach focuses on understanding and interpreting the research phenomenon. Qualitative research is less structured than most quantitative approaches. Data in this approach are any information that can be expressed in nonnumerical form. Data collection for this approach includes participant observation, direct observation, unstructured/ in-depth interviews, case studies, and focus groups.[62]

In Quantitative research approach which is linked to the positivist principle, involves numerical measurement and analysis approach to empirically assess research objectives and uses expression of variables and hypotheses to measure variables and test hypotheses. In this approach the research usually measures behavior, knowledge, attitude, or opinions of the subject matter. This approach focuses on describing, explaining, and predicting the research

[62] *(Saunders, Lewis and Thornhill 2019), (Trochim, Donnelly and Arora 2016), (Neuman 2014), (Cooper and Schindler 2014)*

phenomenon and so the survey methodology is regarded as dominant one for this type of research. Data collection for this approach includes face to face/ telephone interview, longitudinal studies, systematic observations, online and paper surveys, website interceptors, and online polls, etc. while conducting research in this approach, making inference about the total population is required since the researcher hardly ever have access to all the attendants of certain group. Nevertheless, the sample selected to make inference from the larger group should be a representative sample of the population.[63]

The other research approach which is Mixed research is one which uses the characteristics of quantitative and qualitative approach. This approach tries to answer research questions that alone cannot be done by implementing qualitative or quantitative approach. This type of approach is celebrated because of its method to combine both inductive and deductive thinking, its practice of addressing research problem by using more than one research method and different types of data[64].

Advocacy/participatory research approach on the other hand is carried out with the goal of generating facts and testimony to back up a certain cause or view. Pressure groups, lobby groups, and interest groups frequently conduct advocacy research, as do political parties, journalists, and others. According to (Creswell 2009) this research approaches holds that research inquiry needs to be intertwined with politics and a political agenda.

With the four types of research approaches explained above, this research used quantitative research approach for illustrative purpose and nature of the sector being investigated. Consequently, deductive reasoning approach was used as the research begins with a theory-driven hypothesis that assist data collection and analysis. As a result of this approach (general to specific) inference was made to the population from selected samples. Data collection was carried out by using first-hand information (primary data) with 5-point Likert scale questioners.

`[63] *(Zikmund, Babin and Jon C. Carr 2009), (Cooper and Schindler 2014)*
[64] *(Sekaran and Bougie 2016)*

3.2. Research Design and Method

Research design refers to the blueprint of collecting, measuring, and analyzing data that guides the phenomenon under study towards its objective and finally providing an answer to the problem. To ensure the data collected is suitable to answer the problem the research objective is included in the research design. The research design makes sure that major elements of the research like the sample, measurements and methods work together to address the hypotheses of interest.[65]

The purpose of this thesis is to assess the mediating effect information asymmetry has on the relationship between Financial Innovation and Bank Performance, by using quantitative data. Accordingly, the study employed explanatory research design based on the purpose of the study. Explanatory research design is used to establish casual relationships between variables by asking questions of 'How' and 'Why' in determining the relationship between financial innovation and bank performance and also mediating effect of information asymmetry.[66]

To achieve the objective of the research, the study will use survey method. Survey method provides a quantitative description by collecting information about a population of interest opinion. This method is used to survey the opinions and attitudes of the general population under study. Based on the time frame of the study/ survey there are two types of researches; cross-sectional, which is a design that allows the researcher to collect data at one-point in time, and longitudinal that allows the researcher to collect data over a designated period of time. Hence, the study employed cross-sectional design since it studies the present relationship that exist between financial innovation and bank performance.[67]

3.3. Data type and source

Data for this study is collected using primary sources. The primary data was obtained through design of questionnaire that was directed to chief officers, directors, senior managers, managers

[65] *(Cooper and Schindler 2014), (Bajpai 2011), (Sekaran and Bougie 2016), (Trochim, Donnelly and Arora 2016)*
[66] *(Saunders, Lewis and Thornhill 2019)*
[67] *(Creswell 2009), (Edmonds and Kennedy 2017)*

and senior officers employed at head offices of their respective bank which the researcher himself collected for the purpose of analysis and discuss the research objection.

3.4. Target population

The target population for the purpose of this study are Conventional Commercial Banks located in Ethiopia. According to the directory of the National Bank of Ethiopia, there are currently 19 banks that are operational in Ethiopia, of which 18 are commercial banks and 1 is a development bank. As indicated earlier the study sought to investigate Commercial Banks that are engaged in the Conventional Banking model, hence 17 banks that are listed below in Table 2 were considered as the target population.

Table 2 Target Population of the Study

Banks (Conventional Banking)	**Abbreviation**
Commercial Bank of Ethiopia	CBE
Awash International Bank	AIB
Dashen Bank	DB
Bank of Abyssinia	BOA
Wegagen Bank	WB
Hibret Bank	HB
Nib International Bank	NIB
Lion International Bank	LIB
Cooperative Bank of Oromia	CBO
Zemen Bank	ZB
Oromia International Bank	OIB
Bunna International Bank	BuIB
Birhan Bank	BrB
Abay Bank	AB
Addis International Bank	AdIB
Enat Bank	EB
Debub Global Bank	DGB

The study population which is also known as the accessible population is the sub-section of the target population which the study draws conclusion from. It is from which sample is actually selected; it is the operational definition of target population. For both the target population and study population the geographic characteristics and type of units included should be precisely defined. Therefore, two units were targeted on for the sample population. The first unit defines an institutional level target while the second unit defines the institutions department and staff level target. The institutional level unit that the study population targeted took into account the Head Offices of each commercial banks that are operational. This is done with the understanding that significant level of information in regards to the operation and administrative function of the bank is developed around the Head Quarter while branches are offices that engage in similar activities as per the direction they get from HQ. Accordingly, based on the purpose of this study the researcher believed topics like financial innovations, products/ services and bank performance are better dealt in the main office of the organizations and so the study set out to survey at head quarter located in Addis Ababa.[68]

Department and staff level units that the study population targeted include the bank's headquarter departments that are thought to be relevant and could provide significant information for the purpose of the study. Within the selected departments the study sought to survey staffs with experience of chief officers, directors, senior managers, managers and senior officers. This is considered because the study requires high level of insight and opinion from bank personnel's that are responsible and have sufficient knowledge in regards to financial innovation and bank performance of their industry. Accordingly, only chief officers, directors, senior managers, managers and senior officers of relevant departments (R&D department, Credit operation department, Retail Banking department, finance departments and International Business department) were considered.

3.5. <u>Sample Size and Sampling Procedures</u>

The study used stratified random sampling techniques. Stratified random sampling helps in categorizing a population into subgroups and getting a basic random sample from each of the group. This helps ensure that the sample includes relevant population subgroups. This sampling technique is employed in this study to select representative banks from the target population. As a result, using stratified random sampling technique banks that were considered as target population were grouped into four categories according to their bank size (Large banks, medium banks and small banks) and ownership (Public or private). To determine their bank size, each banks asset size was considered.

The study also used simple random sampling technique later to select three banks that are found in each strata. Simple random sampling was used because, first it eliminates the researcher's bias

[68] *(S. Hu 2014), (Henry 1990), (Bickman and Rog 1998)*

entirely. Second, it eventually provides a random result. Third, conventional commercial banks perform nearly identical tasks. The study listed the banks in their category and used a well-known software to generate random sample banks. By using random sample generator sample banks are selected from the list. As a result, 9 private banks and 1 state-owned commercial bank as indicated in Table 3 below were selected as a sample of the target population. [69]

Table 3 Target Population Sample

Sample (bank)	**Strata**
Commercial Bank of Ethiopia	State-owned
Awash International Bank	Large Banks
Dashen Bank	
Bank of Abyssinia	
Lion International Bank	Medium Banks
Wegagen Bank	
Nib International Bank	
Zemen Bank	Small Banks
Addis International Bank	
Debub Global Bank	

To test the hypothesis the study adopted structural equation modeling (SEM). The sample size for SEM is the most important criterion; the sample size for SEM should be at least 100-200. (Anderson and Gerbing 1988), (Ding, Velicer and Harlow 1995), (Tinsley and Tinsley 1987). Since the target population are chief officers, directors, senior managers, managers and senior officers; the selected population in this staff level category are presented below. According to sample banks staff level and department level data, there are 1,804 employees in the target population of this study.

[69] *(Lund Research 2012), (Levy and Lemeshow 2008)*

Table 4 Sample Size Distribution from the Target Population

Department	Banks	Percent from Total Employee		Sample Size Distribution		Distributed		Collected	
		Bank level	*Total Dept. Lev*	*Bank level*	*Total Dept. Lev*	*Bank level*	*Total Dept. Lev*	*Bank level*	*Total Dept. Lev*
Research and Development	CBE	18%	12%	38	211	7	39	5	34
	AIB	13%		28		5		3	
	DB	12%		26		5		4	
	BOA	14%		29		5		5	
	LIB	7%		15		3		3	
	WB	10%		21		4		4	
	NIB	7%		14		3		3	
	ZB	6%		13		2		2	
	ADIB	7%		14		3		3	
	DGB	6%		13		2		2	
Credit Operation	CBE	18%	25%	82	459	15	82	10	60
	AIB	13%		61		11		9	
	DB	12%		56		10		7	
	BOA	14%		64		11		8	
	LIB	7%		33		6		6	
	WB	10%		45		8		5	
	NIB	7%		31		6		4	
	ZB	6%		29		5		3	
	ADIB	7%		30		5		4	
	DGB	6%		28		5		4	
Retail Banking	CBE	18%	23%	73	408	13	75	8	59
	AIB	13%		54		10		7	
	DB	12%		50		9		7	
	BOA	14%		57		10		7	
	LIB	7%		29		5		5	
	WB	10%		40		7		6	
	NIB	7%		28		5		5	
	ZB	6%		26		5		4	
	ADIB	6%		26		5		5	
	DGB	6%		25		5		5	
Finance	CBE	18%	20%	66	367	12	66	9	58
	AIB	13%		49		9		7	
	DB	12%		45		8		7	
	BOA	14%		51		9		8	
	LIB	7%		26		5		5	
	WB	10%		36		6		6	
	NIB	7%		25		4		4	
	ZB	6%		23		4		4	
	ADIB	7%		24		4		4	
	DGB	6%		22		4		4	
International Business	CBE	18%	20%	64	359	12	66	11	56
	AIB	13%		48		9		8	
	DB	12%		44		8		7	
	BOA	14%		50		9		7	
	LIB	7%		26		5		4	
	WB	10%		35		6		5	
	NIB	7%		24		4		2	
	ZB	6%		23		4		4	
	ADIB	6%		23		4		4	
	DGB	6%		22		4		4	
Total	**Sample size Dist.**	**100%**		**1,804**		**328**		**267**	

For sample size calculation the study used statistician Taro Yamane (1967) method. To use this formula the study should have a finite population. After clearly stating the population, it is possible to calculate the sample size. The target population size of this study is 1,804 with the sample size given in the mathematical illustration below.[70]

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

Where: N- Target Population

n- Required Sample Size

e^2- Error rate (95% Confidence)

The target population for this study is 1,804. Hence, the required sample size is calculated as:

$$n = \frac{1{,}804}{1 + 1{,}804(0.05^2)} = 328$$

Using Yamane (1967) sample size formula, the sample size for this study is 328.

3.6. <u>Method of Data Analysis</u>

Data Analysis is a step in scientifical research to test if the data gathered support the hypotheses produced and/or answer the research question sought using statistical analysis method. In this study primary data which was obtained in the form of self-administered questionnaire was collected from chief officers, directors, senior managers, managers and senior officers of commercial banks in Ethiopia and was analyzed using SPSS 26 and Smart pls Software's. Before the collected data are used for analysis, data obtained through questionnaire were logged in, edited and transformed as appropriate to the study. That is, responses that result in inconsistencies, outliers and blank response were checked and followed up.[71]

[70] *(Yamane 1967), (NBE 2019/2020)*
[71] *(Sekaran and Bougie 2016), (Lyons and Doueck 2010)*

The analysis focused in investigating the relationship financial innovation has with bank performance in commercial banks of Ethiopia with the mediating effect of Information Asymmetry. Different tables and charts were also used in the analysis. Descriptive statics was used to describe the population by taking the data collected and entering it to a data structure through tables and explanation to conclude. Besides that, inferential statics was also used to explore and explain the relationships between variables.

In the inferential statistics, multivariate statics technique like factor analysis was used to analyze more than two variables. Factor analysis is a technique that sets out to identify simple patterns by arranging together single items that closely relate to structure a theoretical concept or factor or construct in variables that have a complicated relationship pattern. In factor analysis there are two related types of analysis in which this study employed. This are **EFA** (Explanatory Factor Analysis) and **CFA** (Confirmatory Factor Analysis). EFA is analytical technique that is exploratory in nature; and seeks to reduce large data that has interrelated variables by determining the correlation among the variables in to a smaller set of factors; as a result, it helps to determine the basic factor structure/ model. In this study EFA is used to get the rotated component matrix, which is a matrix that has components in columns and variables in rows that shows the correlation between each of these units. This matrix is used as an input for CFA. CFA is used to confirm the factor structure/ model acquired through EFA is strong and tests statistically the hypothesis structure or particular theoretical model underlying a set of variables is reliable with the data observed. This type of factor analysis is also important in evaluating construct validity since it provides how well the studies theory about the model is consistent with the actual observation. The data from CFA was then later used as an input for SEM (Structural Equation Modeling). SEM is an important method that allows to test/estimate the relationship between constructs and their indicators. Under SEM there are two features of the process: 1) the casual process of the study is shown by a sequence of structural equations (i.e., regression) and 2) this structural association can be represented with illustrations to allow a visible abstraction of the theory under study. Lastly, this model was used to compute the mediational effect of information asymmetry.[72]

3.7. Ethical Consideration

Respondents that participated in this study were assured of their privacy. Participant's response and their identities was also kept confidential.

[72] *(Burns and Burns 2008), (Zikmund, Babin and Jon C. Carr 2009), (W. Watkins 2021), (Tucker and MacCallum 1997), (Fabrigar and Wegener 2012), (Gaskin 2021), (Sarstedt and Mooi 2019), (B. M. Byrne 2016),*

CHAPTER FOUR

RESULTS AND DISCUSSIONS

The purpose of this thesis is to examine the relationship financial innovation has with OTD bank performance and the mediating role information asymmetry has on such relationships. In the prior two portions of this study assessment relevant literatures and methodology adopted were explored.

The following section of this study is structured in a method that support in responding to each research and hypothesis. Data that was collected using a questionnaire is presented, examined and explained using quantitative statistics to address the research objective, question and hypothesis. SmartPLS, STATA and SPSS 26 software were used for data analysis purpose.

The chapter goes through major sections that are relevant and are part of the data analysis. The first section explores target population items that were used in the study followed by non-response bias test, questionnaire pilot test, profile of respondents, quality of data, factor analysis, mediation effect of information asymmetry and findings of empirical results are also included in this chapter.

4.1. Target Population

Target population variables used in this study are selected based ownership and size structure. This are State-Owned Bank, Large Private Bank, Medium Private Bank, and Small Private Bank. The variables used to define the target population are proxies for the asset size of Ethiopian private banks. Ethiopian private banks that have lower 25th percentile based on their asset size are delegated as Small Private banks, private banks that have a 75th percentile and above on the their asst size are delegated as Large Private banks, whereas the rest available private banks are delegated as Medium Private banks. The 25th and 75th were acquired using Stata and the method adapted for the mathematical computation used is described below.

To get the pth percentile, we denote it as $\mathcal{X}_{[p]}$, $P = np/100$P, Let:

$$\boldsymbol{W}_{(\boldsymbol{i})} \sum_{\boldsymbol{j}=\boldsymbol{1}}^{\boldsymbol{i}} \boldsymbol{w}(\boldsymbol{j})$$

We obtain the first index i; (i.e,) $W_i > P$. The p[th] percentile is then:

$$x_{[p]} = \begin{cases} \frac{x_{(i-1)} + x_{(i)}}{2} & \text{if } W_{(i-1)} = P \\ x(i) & \end{cases}$$

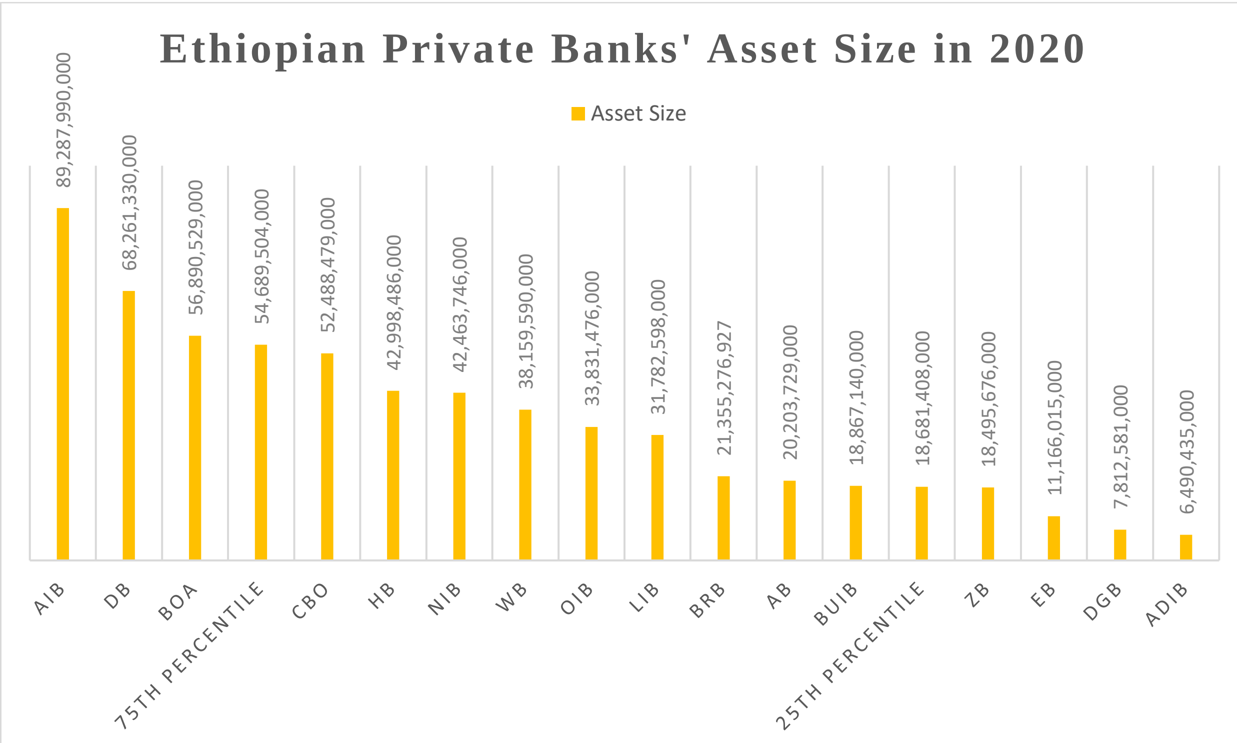

Figure 3 Ethiopian Private Banks' Asset Size in 2020

In 2020, the 25[th] percentile was ETB 18,681,408,000. Private banks that had asset size lower than the 25[th] percentile were Zemen Bank (18,495,676,000), Enat Bank (11,166,015,000), Debub Global Bank (7,812,581,000), and Addis International Bank (6,490,435,000). These banks are delegated as Small Ethiopian Private banks. Private banks that had asset size larger than the 75[th] percentile (54,689,504,000) were Awash International Bank (89,287,990,000), Dashen Bank (68,261,330,000), and Bank of Abyssinia (56,890,529,000). These banks are delegated as Large Ethiopian Private Banks. Private banks that had asset size between 25[th] (18,681,408,000) and 75[th] percentiles (54,689,504,000) were Buna International Bank (18,867,140,000), Abay Bank (20,203,729,000), Birhan Bank (21,355,276,927), Lion International Bank (31,782,598,000), Oromia International Bank (33,831,476,000), Wegagen Bank (38,159,590,000), Nib International Bank (42,463,746,000), Hibret Bank (42,998,486,000), and Cooperative Bank of Oromiya (52,488,479,000). These banks are delegated as Medium Ethiopian Private Banks.

4.2. Non-Response Bias Test

Non-response bias occurs when non-respondents in the studied sample vary in significant manner from those engaged in the study. As a result, non-respondents will portray varied attributes and perspectives in relative to those who responded and participated. On top of this, respondents who participated in the study may not also provide workable data. There are two levels at which data non-response bias occurs. These are survey non-response (unit non-response), where respondents who participated in filling the questionnaire refuses to respond all the questions or are unable to make contact; and item non-response which occurs when respondents do not produce response to certain survey questions. Due to various reasons such as refusal to respond, being unable to locate respondents, and unable to contact even when located; resulted a unit non-response in this study collected data.[73]

For this study a total of 328 questionnaire was set up and handed out for 10 Ethiopian Banks (Commercial Bank of Ethiopia, Awash International Bank, Dashen Bank, Bank of Abyssinia, Lion International Bank, Wegagen Bank, Nib International Bank, Zemen Bank, Addis International Bank, Debub Global Bank). From these 267 usable responses were gathered for quantitative analysis with 81% response rate, which is an acceptable rate.

4.3. Questionnaire pilot test

Smaller versions of studies, which are known as feasibility studies, and the pre-testing or ‘trying out' of a particular research instrument are the two primary forms of pilot studies employed in social science. The importance of piloting a questionnaire, which involves evaluating it with a small group of people who are similar to the sample, is critical since it might reveal misunderstandings and other possible hazards. It helps to modify the questionnaire so that respondents have no trouble answering the questions and capturing the data. It also allows to examine the validity of the questions and the potential reliability of the data that will be

[73] (Saunders, Lewis and Thornhill 2019), (Greener and Martelli 2018), (Sarstedt and Mooi 2019),

collected. Rough estimate of the pilot test data can be done to guarantee that the information gathered will answer the investigation inquiries.[74]

Right before the start of the main investigation, a pilot study was carried. A total of 15 people were chosen at random and the survey was delivered as a pilot testing. The goal of the pilot testing was to make sure that participants fully grasped the survey's questions and to get comments on how to enhance the measurement tool. The results indicated that the survey was overall simple to conduct, and there have been no objections or suggestions for improvement from the survey participants. As a result, no alternations were required.

4.3.1. Validity

A Valid instrument allows to obtain precise data that measures the ideas interested in to be measured. It's also known as measurement validity, and it refers to issues about whether the results of the survey accurately reflect the reality of what is being measured. The various types of validity serve in understanding the relationship between "what we should measure and what we actually measure", enhancing the chances of accurately measuring the latent idea in question.[75]

To assess the measurement validity, the study sampled out from few banks (both private and public bank) several employees in various departments and handed the questionnaire.

Content Validity: Relates to the degree whereby the instrument addresses the study inquiries adequately. An assessment of what constitutes "sufficient coverage" can be established in a variety of ways. One comprises a comprehensive explanation of the study by a review of literature and, when applicable, preceding consultation with others. One more option is to have a panel of people decide if each item in the questionnaire is 'important,' 'helpful but not vital,' or 'not necessary'[76]

[74] (Malmqvist, Hellberg, Möllås, Rose, & Shevlin, 2019), (Baker, 1994), (Somekh and Lewin 2005), (Saunders, Lewis and Thornhill 2019)

[75] (Sarstedt and Mooi 2019), (Saunders, Lewis and Thornhill 2019)

[76] (Sarstedt and Mooi 2019)

This study instrument meets content validity as the measurements sufficiently cover the investigative questions and hold a comprehensive explanation of the study. Moreover, discussion was made with various people and also bank employees and from there response the constructs measurement was considered and the structure of the questionnaire is suitable and simple to comprehend.

Criterion Validity: Also referred to as predictive validity, it is the strength of measurements (questions in a questionnaire) to produce precise estimations and the amount to which the replies truly predict this study inquires. To test criterion-related validity Statistical analysis, such as correlation, is frequently used.[77]

As a result, based on the responses of the selected respondents, The study observed that their responses on measures are associated across variables that are known to be correlated, demonstrating that the instrument meets criterion validity.

4.3.2. **Reliability**

Consistency is what reliability refers to and therefore, it is involved with the robustness of the survey questions, in specific, whether it could obtain stable research findings at multiple points in time and scenarios, including with various samples. Respondents may sometimes give contradictory answers as a result of a misunderstanding of the instructions because they are accustomed with the work of filling out questionnaires, between 5% and 9% of participants in a survey do not read instructions. The homogeneity of a metric is represented by its internal consistency. In other terms, the questions should "stick together as a set" and be able to evaluate the same notion independently so that participants associate individual item with the same overall meaning. This may be assessed by aiming at whether the components and subsets of components in the measuring instrument are significantly correlated. Correlating scores on

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[77] ibid

subsets of items that comprise a scale can be used to assess the internal consistency of a multiple-item measure. [78]

Several measures have been developed to assess the scale's overall internal consistency. Cronbach's alpha is the most well-known and frequently used of these indexes, and it is mainly focused on the correlation matrix between all items as well as the number of items. The Formula for calculating Cronbach's alpha is[79]:

n - number of items in the scale
$\bar{r}$ - mean correlation

$$\propto= \frac{n\bar{r}}{1+\overline{r(n-1)}}$$

The Cronbach's Alpha coefficient generally varies from 0 to 1, for assuming item homogeneity, according to (Burns and Burns 2008) an alpha of 0.8 or above is considered highly acceptable, whereas 0.7 is considered the limit of acceptability. On the other hand, (Sarstedt and Mooi 2019) stated that a 0.6 lower limit coefficient is acceptable for exploratory studies while in the most advanced stages of study, values of 0.80 or above are even considered satisfactory.

To assess the reliability (internal consistency) of the study's constructs (assess the measurement items inter-item consistency), two criteria are used for evaluation. The first one as stated earlier is the Cronbach's Alpha while the second one is composite reliability. Composite reliability as a measurement to determine the internal consistency takes into consideration the various outer loadings of the indicator variables. The Formula for calculating Composite reliability is[80]:

$$\rho_c = \frac{(\sum_{i=1}^{M} l_i)^2}{(\sum_{i=1}^{M} l_i)^2 + \sum_{i=1}^{M} var(e_i)}$$

$\boldsymbol{l_i}$ - standardized outer loading
$\boldsymbol{i}$- indicator variable
$\boldsymbol{M}$ - specific construct measured with M indicators
$\boldsymbol{e_i}$ - measurement error of indicator variable i
$\boldsymbol{var(e_i)}$ - denotes the variance of the measurement error

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[78] (Hardy and Ford 2014), (Saunders, Lewis and Thornhill 2019), (Sekaran and Bougie 2016), (Zikmund, Babin and Jon C. Carr 2009)

[79] (Corbetta 2003)

[80] (Hair, et al. 2017)

(Hair, et al. 2011) made a remark about the composite reliability value and pointed out that reliability which is higher than 0.9 is considered excellent, higher than 0.8 is good, higher than 0.7 is acceptable, higher than 0.6 is satisfactory, and lower than 0.5 indicate lack of reliability[81].

To assess the reliability, the study starts by first conducting reliability analysis on the lower order construct as indicated in fig 2 above. Table 5 below presents the values of Cronbach's Alpha and Composite Reliability.

Table 5 Construct Reliability Analysis (Cronbach Alpha and Composite Reliability)

	Cronbach's Alpha	**Composite Reliability**
Loan Sale	0.936	0.950
Loan Syndication	0.912	0.934
Securitization	0.847	0.888
Adverse Selection	0.870	0.910
Moral Hazard	0.914	0.936
Asset Quality	0.903	0.928
Liquidity	0.856	0.891
Capital Adequacy	0.823	0.879
Profitability	0.856	0.893

Cronbach's Alpha results ranged from .823 to .936, while Composite Reliability results were between .879 and .950. The reliability statistics for both indices of reliability are higher than the acceptable threshold of .70 (Hair, et al. 2011). As a result, construct reliability has been formed.

The next approach is to conduct reliability analysis on the higher order constructs as indicated in fig 1 above. Both construct reliability and convergent validity were assessed in the data analysis: factor analysis section of this study below in sub-section "4.6.2.1.2 Validating Higher Order Construct"

[81] (Lin, et al. 2020)

4.4. Profile of Respondents

Analysis of survey data as listed in Table 6 below discovered that 67% of the participants in the survey were male showing a considerable participation. Majority of the sample are between the ages of 31 and 45, followed by those between the ages of 18 and 30. (27.7% percent). Only 25.1% of responders are between the age of 45 and 55. The result of the participant's academic background shows that Degree holders made up 34.1% and Masters holders made up 65.9% of the respondents. In general, when observing at respondents' job experience, the study found that 27.3% of the participants have experience of between 6-10, 26.6% have worked for 11-15 years, 34.1% have worked for 16-20 years, and the rest have worked above 21 years. Both the participants educational background and experience were thought to have contributed to a better grasp of the questionnaires and hence a more valid response. All Nine (9) Sampled Banks were covered by the surveys; namely Commercial Bank of Ethiopia, Awash International Bank, Dashen Bank, Bank of Abyssinia, Lion International Bank, Wegagen Bank, Nib International Bank, Zemen Bank, Addis International Bank, Debub Global Bank.

Table 6 Study Participants Profile Description[82]

Variable	**Category**	**Frequency**	**Percentage (%)**
Gender	Male	179	67.0
	Female	88	33.0
Age	18 - 30	74	27.7
	31- 45	126	47.2
	45 - 55	67	25.1
	55 and above	-	-
Educational Level	Diploma	-	-
	Degree	91	34.1
	Master’s	176	65.9
	Ph.D.	-	-
Experience	0-2	-	-
	3-5	-	-

[82] Source: Analysis of survey data

	6-10	73	27.3
	11-15	71	26.6
	16-20	91	34.1
	21 and above	32	12.0
Position	Chief Officer	29	10.5
	Director	54	19.6
	Senior Manager	63	22.8
	Managers	58	21.0
	Senior Officer	72	26.1
Bank Name	CBE	43	16.1
	AIB	34	12.7
	DB	32	12.0
	BOA	35	13.1
	LIB	23	8.6
	WB	26	9.7
	NIB	18	6.7
	ZB	17	6.4
	ADIB	20	7.5
	DGB	19	7.1

4.5. Data Analysis: Assessing the Quality of Data

4.5.1. Assessing the Sample Size

Prior to undertaking exploratory factor analysis, it is also crucial to ensure that the data set is appropriate by assessing sample size. Sample size is related to both cost and time. Based on these two limitations, a study must take a sample that will generate results that are statistically significant, statistically robust, or statistically justifiable, but most crucially, indicative of the overall population. A lower sample size may hide a considerable influence that occurs in the actual population (results in perpetrating a Type II error). Furthermore, the minimal sample size must assure that the statistical method's results are statistically significant and the model is generally applicable.[83]

SEM's versatility allows for the assessment of complex interactions, the use of multiple forms of data, and comparisons of alternative models. However, because of these characteristics of SEM, developing generic sample size criteria is problematic. Even with all of this, a number of guidelines have been proposed, and the rules-of-thumb that is mostly used by scholars in regards to minimum sample size includes a sample size of 100 or 200. This study's sample size was 328, which is ample for conducting the EFA, CFA, and structural model. [84]

4.5.2. **Assessing Common Method Bias**

In research, self-administered questionnaires are a very popular data gathering tool. In survey studies, the variables used are operationally defined through a set of items that make up a pre-existing or freshly designed scale. While questionnaires are one of the most frequently used technique in the social sciences, they also carry the risk of common method bias, which can compromise the reliability and validity of empirical findings. When the same response technique is used to capture both the independent and dependent variables, common method bias can develop. Across fields of research, there is widespread agreement that common method bias can have a major influence on a study's empirical data and related conclusions.[85]

Although, according to (Kock and Lynn, Lateral Collinearity and Misleading Results in Variance-Based SEM: An Illustration and Recommendations. 2012) and (N. Kock 2015), studies can carry out a full collinearity assessment to check a study's common method bias, there is no actual built-in approach in Smart-PLS 3 software. According to ‘Kock’ in the two papers cited above a full collinearity test is proposed as a “comprehensive procedure for the simultaneous assessment of both vertical and lateral collinearity”. Using this technique, Variance inflation

[83] (Adams, Khan and Raeside 2014), (Hair, et al. 2011)

[84] (MacCallum, et al. 1999), (Boomsma, Robustness of LISREL against small sample sizes in factor analysis models. 1982), (Boomsma 1985), (Wolf, et al. 2013)

[85] (Baumgartner and Weijters 2012), (Kock, Berbekova and Assaf 2021), (Podsakoff, MacKenzie and Podsakoff 2012)

factors (VIFs) are computed across all latent variables in a framework which is entirely automated using the program Smart-PLS 3. Their paper asserts that a VIF value that is larger than ‘3.3’ is seen to be a sign of pathological collinearity, as well as a sign that a model may be affected by common method bias. It is only when all VIFs from a complete collinearity assessment are equal to or less than 3.3, the model is clear of common method bias. The VIFs used for the purpose of assessing Common Method Bias are derived from the software and are found as “Inner VIF Values” under the Collinearity Statistics (VIF) after running a PLS Algorithm calculation.

As indicated below from Table 7-14 VIF values ranged from (1.054 -2.335) for loan sale, (1.063-2.059) for loan syndication, (1.176-2.194) for securitization, (1.057-2.175) for adverse selection, (1.048-2.172) for moral hazard, (1.066-2.215) for asset quality, (1.07-1.388) for liquidity, (1.068-1.518) for capital adequacy, and (1.065-2.237) for profitability. Since their VIF values are below the ‘3.3’ threshold, the result shows that the study is free from common method bias.

Table 7 Collinearity Inner VIF Values (Loan Sale)

	Loan Sale
Adverse Selection	1.233
Asset Quality	1.307
Capital Adequacy	2.176
Liquidity	2.335
Loan Sale	
Loan Syndication	1.071
Moral Hazard	1.289
Profitability	1.37
Securitization	1.054

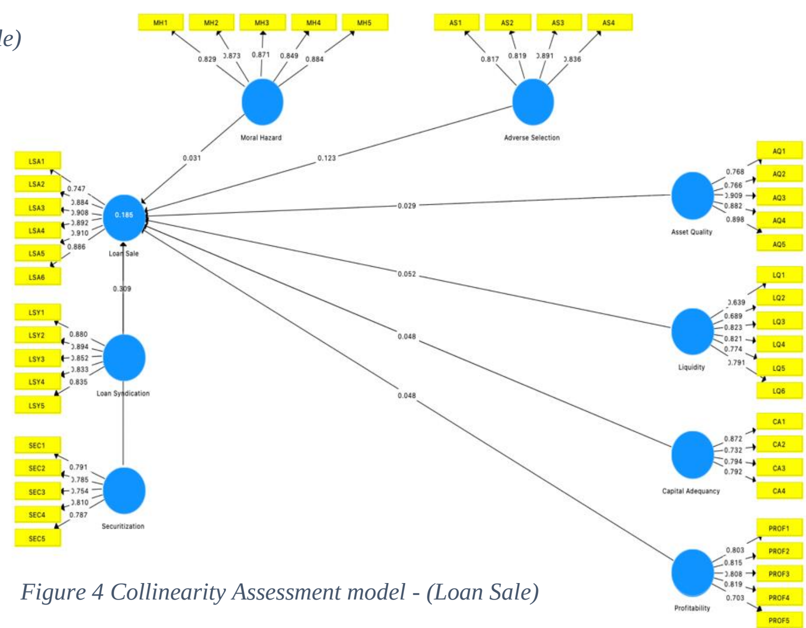

Figure 4 Collinearity Assessment model - (Loan Sale)

Source: Smart-PLS Output

Table 8 Collinearity Inner VIF Values (Loan Syndication)

	Loan Syndication
Adverse Selection	1.268
Asset Quality	1.34
Capital Adequacy	1.834
Liquidity	2.059
Loan Sale	1.091
Loan Syndication	
Moral Hazard	1.329
Profitability	1.41
Securitization	1.063

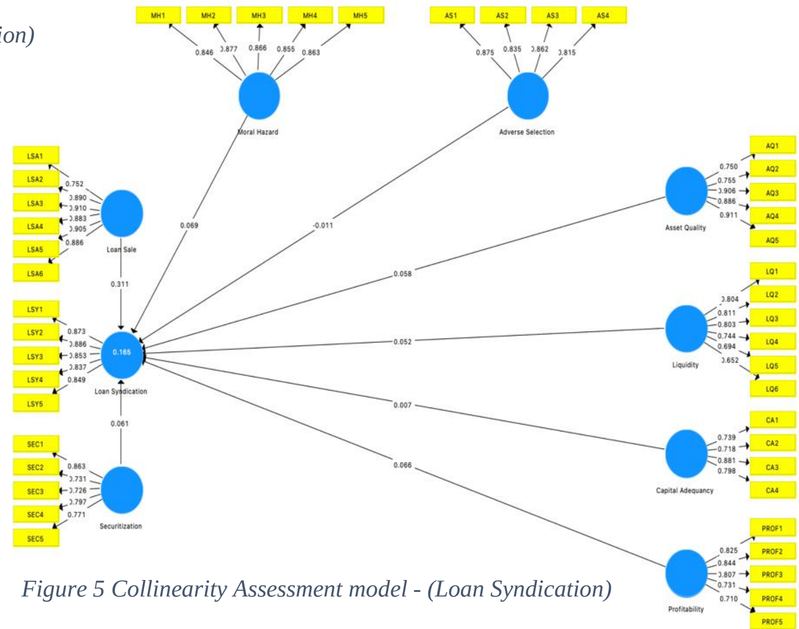

Figure 5 Collinearity Assessment model - (Loan Syndication)

Table 9 Collinearity Inner VIF Values (Securitization)

	Securitization
Adverse Selection	1.197
Asset Quality	1.353
Capital Adequacy	2.093
Liquidity	2.194
Loan Sale	1.206
Loan Syndication	1.176
Moral Hazard	1.234
Profitability	1.253
Securitization	

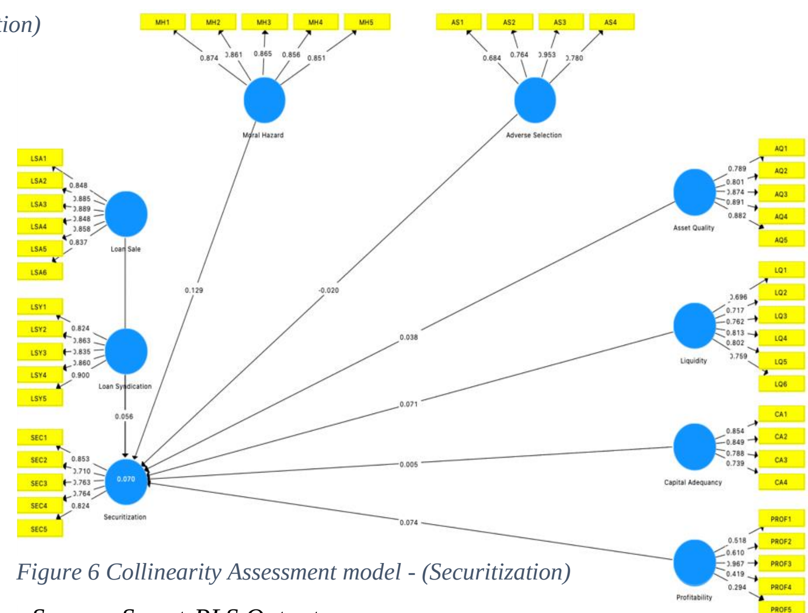

Figure 6 Collinearity Assessment model - (Securitization)

Source: Smart-PLS Output

Table 10 Collinearity Inner VIF Values (Moral Hazard)

	Moral Hazard
Adverse Selection	1.148
Asset Quality	1.266
Capital Adequacy	1.981
Liquidity	2.172
Loan Sale	1.191
Loan Syndication	1.175
Moral Hazard	
Profitability	1.385
Securitization	1.048

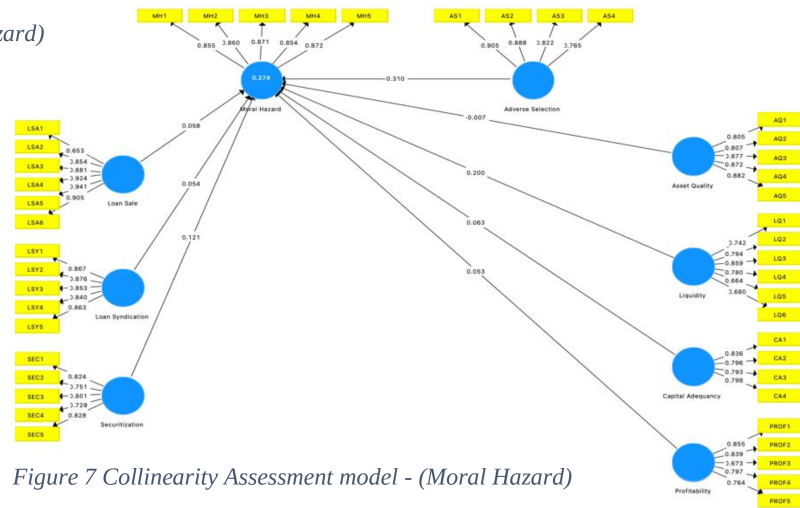

Figure 7 Collinearity Assessment model - (Moral Hazard)

Source: Smart-PLS Output

Table 11 Collinearity Inner VIF Values (Adverse Selection)

	Adverse Selection
Adverse Selection	
Asset Quality	1.232
Capital Adequacy	1.874
Liquidity	2.175
Loan Sale	1.184
Loan Syndication	1.171
Moral Hazard	1.234
Profitability	1.387
Securitization	1.057

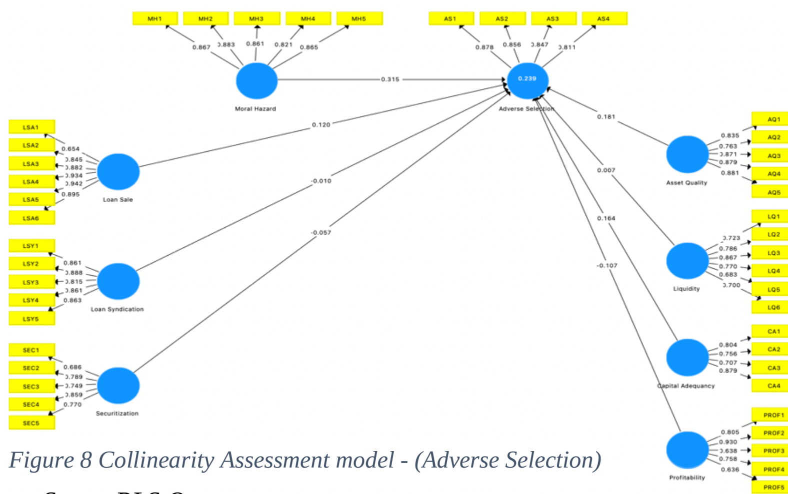

Figure 8 Collinearity Assessment model - (Adverse Selection)

Source: Smart-PLS Output

Table 12 Collinearity Inner VIF Values (Asset Quality)

	Asset Quality
Adverse Selection	1.181
Asset Quality	
Capital Adequacy	2.062
Liquidity	2.215
Loan Sale	1.201
Loan Syndication	1.187
Moral Hazard	1.266
Profitability	1.327
Securitization	1.066

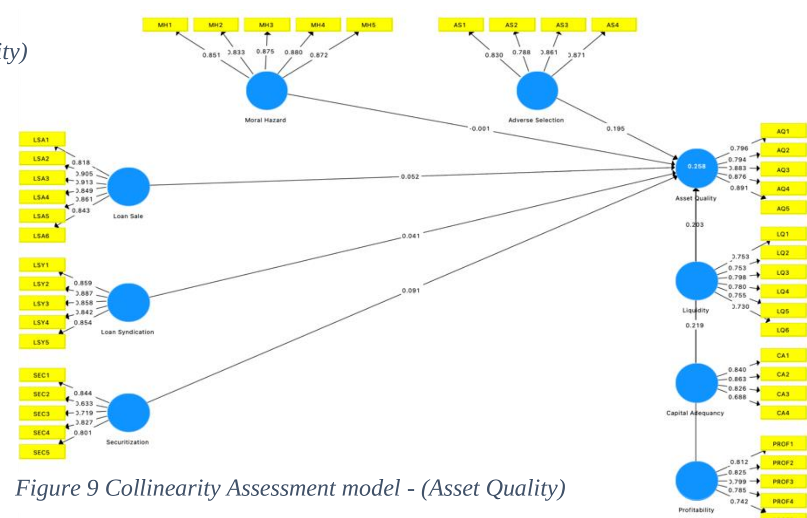

Figure 9 Collinearity Assessment model - (Asset Quality)

Table 15 Collinearity Inner VIF Values (Liquidity)

	Liquidity
Adverse Selection	1.251
Asset Quality	1.27
Capital Adequacy	1.388
Liquidity	
Loan Sale	1.202
Loan Syndication	1.184
Moral Hazard	1.299
Profitability	1.323
Securitization	1.07

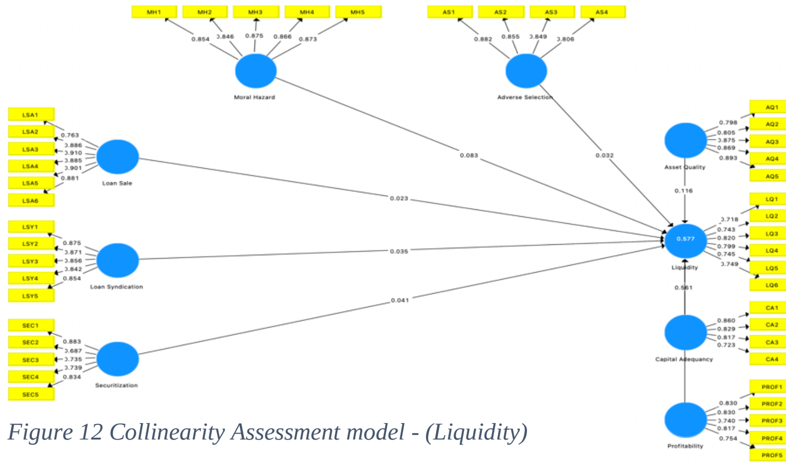

Figure 12 Collinearity Assessment model - (Liquidity)

Source: Smart-PLS Output

Table 14 Collinearity Inner VIF Values (Capital Adequacy)

	Capital Adequacy
Adverse Selection	1.248
Asset Quality	1.301
Capital Adequacy	
Liquidity	1.518
Loan Sale	1.214
Loan Syndication	1.193
Moral Hazard	1.298
Profitability	1.348
Securitization	1.068

Source: Smart-PLS Output

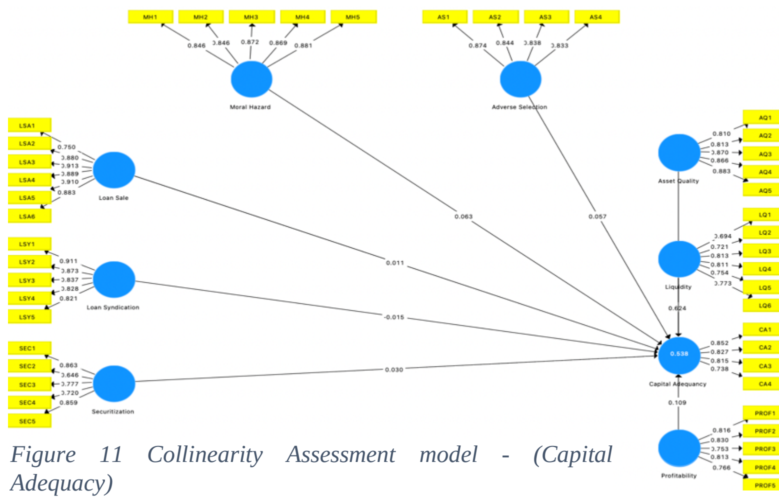

Figure 11 Collinearity Assessment model - (Capital Adequacy)

Table 13 Collinearity Inner VIF Values (Profitability)

	Profitability
Adverse Selection	1.205
Asset Quality	1.279
Capital Adequacy	2.079
Liquidity	2.237
Loan Sale	1.209
Loan Syndication	1.192
Moral Hazard	1.237
Profitability	
Securitization	1.065

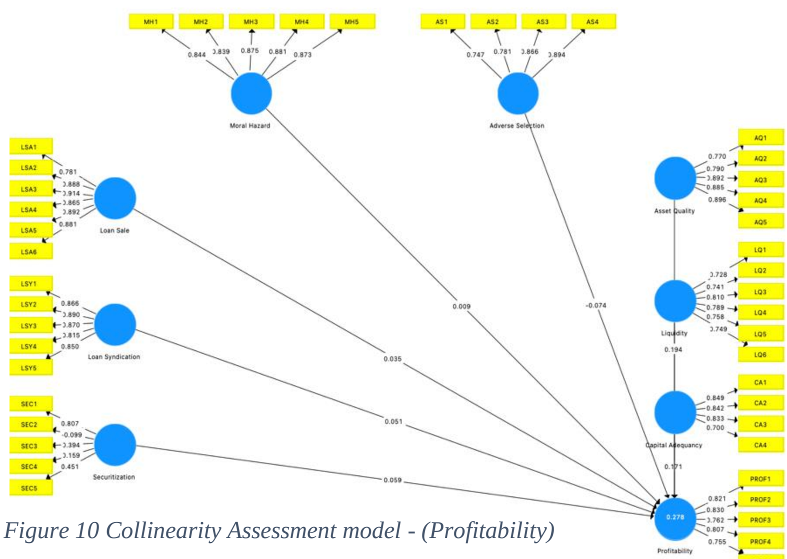

Figure 10 Collinearity Assessment model - (Profitability)

Source: Smart-PLS Output

4.5.3. Assessing Missing Data

There are two types of missing data. The first occurs when the survey participant do not respond or gives unclear response to the survey questions, while the other occurs because of the writer fault in filling the data accurately, leaving relevant columns unfilled. If the amount of missing data isn't quite so large, one of the alternatives useable to any study is to ignore the missing data alone and conduct the analysis. There is no technical guidance on the acceptable threshold but as a rule of thumb, missing data must not account for more than 10% of total sample size.[86]

As there were no missing data, the study was able to proceed with the ‘267’ acceptable questionnaires for subsequent EFA, CFA, and structural model analysis.

4.5.4. Assessing Outliers

An outlier occurs when there is an extreme observation to a specific question or extreme answers to all inquiries. Outliers must be understood in the context of the research, and such assessment need to be determined on the sort of information they provide. Outliers can occur as a result of data gathering mistakes. However, extremely high or low numbers can also exist in the real world. Outliers can also emerge when combinations of variable values are extremely. The first approach to handle against outliers is identifying them. [87]

To identify outliers in the data set, the study used the IBM SPPS software. In order to detect univariate outliers, the studies examined the frequency distributions of z scores. A z-score is a standardized score that is assigned to a continuous variable based on its relationship to the mean. In a normally distributed data 95 percent of items will lie within z-scores of ±1.96 and 99 percent of items will fall between ±2.58. The recommended value for identifying outliers is an absolute value of ±3.29. In other terms, a z-score more than +3.29 or less than -3.29 is regarded as an

[86] (Bajpai 2011)

[87] (Hair, et al. 2011)

outlier instance. Accordingly based on the standard values set by scholars no univariate outliers were identified in the study data set. [88]

4.5.5. Assessing Linearity Assumption

The dependent and independent variables have a linear relationship. The extent to which "the change in the dependent variable is connected to the change in the independent variables" is referred to as linearity. The linearity may be influenced by two factors. First, outliers (cases with high values across one or more variables) may defy the linearity assumption. Secondly, the values for one or more variables may deviate from the linearity assumption. The data values for these variables may need to be changed. To assess the linearity assumption the study used IBM SPSS software curve estimation. The curve estimation function in SPSS allows to create numerous regression models with a separate independent variable while assuming various nonlinear interactions. Following the curve estimation evaluation, all relationships were found to be sufficiently linear to be explored using a covariance-based SEM algorithm.[89]

4.5.6. Assessing Indicator Multicollinearity Assumption

When two independent variables are correlated in a multiple regression analysis, it is termed as the collinearity, but whenever three or much more variables are correlated, this is related to as multicollinearity. And in the most extreme condition (where the correlation between two independent variables is equal to ±1), multicollinearity merely makes computation of regression coefficients "impossible". In all other situations, it makes the regression coefficient estimations inaccurate. To assess multicollinearity problem the VIF value is a more often used measurement that helps in detecting multicollinearity. Various scholars suggest a VIF value exceeding 5 as 'problematic' and cause for concern (Menard 2001); (Hair, et al. 2011) while a VIF exceeding 10 as a serious collinearity problem (Vittinghoff, et al. 2012) when trying to assess and identify multicollinearity, As such there is no general agreement on what the cut-off centered on VIF values should be. This study used the cutoff point for VIF value as 5. Table 17 below presents

[88] (Grove, Burns and Gray 2013), (Polit 2010), (Tabachnick and Fidell 2013), (Mowbray, Fox-Wasylyshyn and El-Masr 2019)

[89] (Saunders, Lewis and Thornhill 2019), (Sarstedt and Mooi 2019)

the VIF Values for each indicator used in the study and as shown in the table each indicators satisfies the recommended threshold of below 5 VIF values. Hence, the data used in the study does not have a multicollinearity problem.[90]

Table 16 Multicollinearity Statistics (VIF) for indicators[91]

	VIF
LSA1	2.025
LSA2	3.461
LSA3	4.02
LSA4	4.31
LSA5	3.076
LSA6	3.86
LSY1	2.663
LSY2	3.075
LSY3	2.518
LSY4	2.595
LSY5	2.61
SEC1	1.915
SEC2	1.721
SEC3	1.824
SEC4	1.705
SEC5	2.083
MH1	2.542
MH2	2.58
MH3	2.948
MH4	2.846
MH5	2.795
AS1	2.617
AS2	2.543
AS3	2.076
AS4	1.769
AQ1	2.008
AQ2	1.96

[90] (Bajpai 2011), (Sekaran and Bougie 2016)

[91] Analysis of survey data using Smart-PLS 3

AQ3	3.087
AQ4	3.071
AQ5	2.999
LQ1	1.765
LQ2	2.003
LQ3	2.075
LQ4	2.085
LQ5	1.795
LQ6	1.841
CA1	1.991
CA2	1.92
CA3	1.765
CA4	1.461
PROF1	1.879
PROF2	1.878
PROF3	1.64
PROF4	2.182
PROF5	1.89

4.5.7. Assessing Normality Assumption

The test of normality is a crucial factor in identifying central tendency measurements and statistical approaches for data analysis. The central limit theorem asserts that if a sample size of 100 or more observations is used, normality violations are not a significant problem. The normality assumption implies that the data came from a population with a normal distribution. There are some characteristics of a normal distribution, the first being symmetrical with regard to the distributions of mean when the mean, median, and mode are all the same. The other characteristics is; a horizontal asymptote exists for the normal distribution (i.e., the curve reaches the x-axis but it never crosses it). Since the sample distribution shall be normal with the normality assumption, it states that every independent sample must be spread normally when comparing two samples. Otherwise, parametric tests shall not be conducted if either of the independent samples deviates from normality because the type I error rate is influenced (i.e., parametric tests are strong in aspects of type I error rate), and the type I error rate rises as the spread of the groups separates from one another. The skewness, kurtosis, are among the most used methods for testing the normality of continuous data. Skewness refers to how symmetrical a variable's distribution is towards its mean value. When a variable's response distribution stretches to the right or left, it's called skewed. While on the other hand, kurtosis is used as a metric for determining if a distribution is overly peaked (i.e., an extremely narrow distribution with the majority of responses in the middle). This study conducted skewness and kurtosis tests to assess normality issues in the data using SPSS. In order to verify a normal univariate distribution, values for skewness and kurtosis are regarded acceptable between -2 and +2. The study concludes the analysis conducted on the study variables shows that the response distribution data are normally distributed (refer to appendix C). [92]

4.6. Data Analysis: Factor Analysis

Factor Analysis is a multivariate statistical technique that takes observable correlations (variability) as input and discovers a lesser set of unobserved variables, termed as factors, that better characterize the original data. It aims to investigate if the observed variables could be explained substantially or totally in light of a fewer set of mega-variables or underlying factors. If a group of items are linked together, they have something in connection. A factor is a term used to describe something that has something in common. There are two kinds of factor analysis: Explanatory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA).[93]

4.6.1. Explanatory Factor Analysis

EFA seeks to cut down data sets with a great number of variables into a lesser number of factors, allowing the underlying factor model to be identified. As a result, EFA is exploratory. EFA does not depend on prior assumptions about the factor structure that we may discover. That is, each factor and each item may have a relationship. Though some of these connections are weak, others are strong, implying that these components accurately represent an underlying factor. As a result, an EFA uncovers the range of factors as well as the items that belong to each factor. The objective of EFA is to describe as many relationships between observed variables as feasible.

[92] (Mishra, et al. 2019), (Ghasemi and S 2012), (Boslaugh and Watters 2008), (Rietveld and van Hout 2015), (Orcan 2020), (Cain and Yuan 2017), (George and Mallery 2010), (Hair, et al. 2010)

[93] (Trochim, Donnelly and Arora 2016), (Burns and Burns 2008),

Measured variables are considered to interact with one another in EFA because of underlying latent constructs known as factors. It also implies that some variance is explained by unique variables in addition to common causes. Unique factors are made up of two types of variation: specific variance (systematic variance particular to a given studied variable) as well as error variance (unreliable measurement error). [94]

Factor Extraction

The primary step in conducting EFA is factor extraction, which is crucial for understanding the hidden structure. The fundamental factors are determined mathematically using the correlation matrix. In other term extraction basically corresponds to the process of evaluating how many factors within the data set best explain the observed covariation matrix. Since (Spearman 1904) initially proposed EFA, scholars and practitioners have developed a multitude of extraction methods. Some of the various extraction method include, alpha analysis, non-iterated principal axis (PA), maximum likelihood (ML), iterated principal axis (IPA), unweighted least squares (ULS), Image analysis, weighted least squares (WLS), and generalized least squares (GLS). [95]

This study used the principal component method for factor extraction; first step in conducting EFA. The objective of PCA is to reduce scores on a large number of observed variables to scores on a smaller number of composite variables which maintain as much information from the initial measured variables as feasible. The principal component approach was employed in this study to extract components from the findings of univariate analysis, and Variamax rotation was utilized to interpret the factors. The Kaiser-Meyer-Olkin (KMO) and Bartlett's test of sphericity are two statistical measures created by SPSS 26 that are used to assess the factorability of any data. The Kaiser-Meyer-Olkin is a sampling adequacy metric. It compares measured correlation coefficients to bit partial correlation coefficients in terms of magnitude. This should be a significant number, more than 0.5, in order to proceed with a decent factor analysis. The proportion of variation for variables used in the study is shown by this statistic, which is the common variance. To put it another way, this is the total variation due to the underlying causes.

[94] (Burns and Burns 2008), (Sarstedt and Mooi 2019), (M. W. Watkins 2021)

[95] (W. Watkins 2021), (Finch 2020)

According to (Adams, Khan and Raeside 2014) KMO values are explained in a range as: “>0.9 measure as marvelous; >0.8 measure as meritorious; >0.7 measure as middling; >0.6 measure as mediocre and between 0.5 and 0.6 measure as miserable.” Simultaneously, the Bartlett's test of sphericity is applied to measure the null hypothesis where the correlation matrix in the population is a diagonal matrix. That is this statistic determines whether or not the population correlation matrix comprises an identical matrix. It is vital to highlight that the factor analysis is worthless with an identity matrix. The degree of link between the variables may be determined using the significance level. A number less than 0.05 implies that the data do not yield an identity matrix. This indicates that there is a substantial association between the variables used in the factor analysis. [96]

Table 17 KMO and Bartlett's Test[97]

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.868
Bartlett's Test of Sphericity	Approx. Chi-Square	8039.214
	df	990
	Sig.	.000

Table 18 above reveals that the KMO value is **0.868**, which according to (Adams, Khan and Raeside 2014) is meritorious (excellent). We can observe from the same table also that Bartlett's test is significant. That is, its likelihood of association is less than 0.05; with a value of **0.000** as indicated in the table. This implies that the variables have some association with one another, which is necessary if we are looking for an underlying factor that reflects a collection of variables. As a result, the study resumed with the analysis.

Communality

[96] (M. W. Watkins 2021), (Burns and Burns 2008), (Bajpai 2011), (Adams, Khan and Raeside 2014)

[97] Source: Analysis of survey data using SPSS 26

Communality is a metric of the proportion of a variable's variance that can be attributed by the factors. It illustrates to see how much variance any variable factor extraction may generate. A comparatively high communality shows that a variable has a lot in similarity with other variables as a whole. A low communality indicates the variable doesn't exhibit a strong connection with other variables. The component may not be a common factor or may represent a different dimension. In general, extracted factors must make up roughly 50% of a variable's variation. Hence, the communalities ought to be greater than 0.50. Poor reliability is one rational articulation for low communality. Another psychometric cause for poor communality is that a measure is reliable but not related to the area of interest, therefore it has minimal common variation with the components that reach that topic. As a result, the validity of variables measured should be maintained as well. [98]

As indicated in the communality result (*refer to Appendix D*), every one of the variables in this study scored more than 0.5, suggesting a high level of communality.

Total Variance Explained

Total variance explained is a method of reducing a large number of items into a manageable amount before further investigation. It is critical for the study to understand what proportion of items were used to construct the study. This method divides components with eigenvalues (which is a measure of explained variance) larger than 1.0 into several components. The amount of variation indicated by each factor is measured by its eigenvalues. The most frequent criterion is to measure the number of components dependent on the number of eigenvalues higher than 1.0, which is the standard for most statistical tools. The underlying assumption is that one variable has the same total variance as somewhat of a factor with an eigenvalue of 1.0. Factors, which are a set of variables, with less details than a single variable are typically ineffective. [99]

To establish how much factors to 'extract,' the study analyzed the information presented in the result. Using Kaiser's approach, the study concern were factors with an eigenvalue of 1 or greater. The Total Variance Explained in Table 19 below shows how many components match

[98] (M. W. Watkins 2021), (Zikmund, Babin and Jon C. Carr 2009), (Sarstedt and Mooi 2019), (W. Watkins 2021)

[99] (Mohd, et al. 2020), (Garba, et al. 2022), (Zikmund, Babin and Jon C. Carr 2009)

this condition. The study scanned the values in the first set of columns, marked Initial Eigenvalues. The eigenvalues for each factor are listed. All the Nine components in this study have eigenvalues greater than 1. (9.959, 4.715, 3.826, 3.106, 2.802, 2.715, 2.069, 1.769, 1.036). These Nine components account for **71.105%** of the variation (see *Cumulative %* column). This value is acceptable since it surpasses the minimal threshold of 60%. [100]

Table 18 Total Variance Explained[101]

Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% Of Variance	Cumulative %	Total	% Of Variance	Cumulative %
1	9.959	22.130	22.130	9.959	22.130	22.130
2	4.715	10.477	32.607	4.715	10.477	32.607
3	3.826	8.502	41.109	3.826	8.502	41.109
4	3.106	6.903	48.012	3.106	6.903	48.012
5	2.802	6.226	54.238	2.802	6.226	54.238
6	2.715	6.033	60.272	2.715	6.033	60.272
7	2.069	4.599	64.870	2.069	4.599	64.870
8	1.769	3.932	68.802	1.769	3.932	68.802
9	1.036	2.302	71.105	1.036	2.302	71.105
10	.862	1.915	73.019			
11	.738	1.641	74.660			

[100] (Pallant 2020), (Awang 2012), (Hair Jr, et al. 2019), (A. S. Hoque, et al. 2017), (Hoque and Awang 2016)

[101] Source: Analysis of survey data using SPSS 26

12	.696	1.547	76.207
13	.638	1.418	77.625
14	.613	1.362	78.986
15	.566	1.258	80.244
16	.541	1.202	81.446
17	.513	1.140	82.586
18	.481	1.069	83.655
19	.470	1.045	84.700
20	.458	1.017	85.716
21	.448	.996	86.712
22	.419	.930	87.642
23	.408	.906	88.549
24	.389	.864	89.413
25	.367	.815	90.228
26	.348	.774	91.001
27	.334	.742	91.743
28	.307	.683	92.427
29	.286	.636	93.063
30	.285	.634	93.696
31	.271	.603	94.299
32	.264	.587	94.886
33	.240	.533	95.419

34	.233	.517	95.936
35	.218	.485	96.421
36	.212	.471	96.892
37	.200	.445	97.338
38	.192	.427	97.764
39	.184	.408	98.172
40	.168	.373	98.545
41	.162	.359	98.904
42	.154	.343	99.247
43	.127	.281	99.528
44	.120	.266	99.794
45	.093	.206	100.000
Extraction Method: Principal Component Analysis.			

Factor Loading

The ultimate result of exploratory factor analysis is a continuum of components presented in the order from which each impact the variance. Factor loading evaluates the "strength and direction" of each common factor's impact on each of the measurements under consideration. The common factors are represented by the matrix columns, and the measured variables are represented by the matrix rows in the factor loading matrix. Items with low factor loadings on a factor that has a major impact on other items measuring the same construct are considered to be poor measurements of the intended construct. Factor loadings, which determine the amount by which a variable contributes to a factor (across a scale of +1.0 to -1.0), are also given, and variables with poor factor loadings (i.e., a minimal contribution to the factor's establishment) are preemptively removed.[102]

This study used the “outer Loadings” result produced by SmartPLS because SPSS does not perform a PLS path modeling analysis. SmartPLS calculates composite model estimate scores while SPSS's factor-based estimate relies solely on the construct. Hence, carrying out with SmartPLS outer loading result, variables with an outer loading of 0.7 or greater are thought to be incredibly suitable. While a loading point of 0.5 is considered acceptable; variables with values just under 0.5 must be removed. (Henseler, Ringle and Sinkovics 2009) stated that variables with loading range of 0.4 and 0.7 ought to be evaluated before being eliminated, whereas (Hulland 1999) claimed instead that 0.4 as the permissible loading threshold. If removing these indications improves the composite reliability, then factors should be removed otherwise they should be kept. Based on the arguments made by various scholars the study used a cut-off value for outer loading as 0.5 threshold. According to the factor loading output generated in Table 20 below, the study had no factor loading below the recommended threshold value of 0.5, hence no item was further removed. [103]

Table 19 Factor Loadings[104]

	LSA	LSY	SEC	MH	AS	AQ	LQ	CA	PROF
LSA1	0.736								
LSA2	0.879								
LSA3	0.906								
LSA4	0.899								
LSA5	0.916								
LSA6	0.887								
LSY1		0.872							
LSY2		0.881							
LSY3		0.854							
LSY4		0.838							
LSY5		0.853							

[102] (Fabrigar and Wegener 2012), (Mindrila 2017)

[103] (Aftab and Ismail 2014), (Gotz, Liehr-Gobbers and Krafft 2010), (Chin 1998), (Hair, et al. 2010)

[104] Source: Analysis of survey data using Smart PLS 3

SEC1	0.857						
SEC2	0.694						
SEC3	0.769						
SEC4	0.751						
SEC5	0.835						
MH1		0.851					
MH2		0.851					
MH3		0.873					
MH4		0.865					
MH5		0.874					
AS1			0.857				
AS2			0.831				
AS3			0.859				
AS4			0.837				
AQ1				0.802			
AQ2				0.780			
AQ3				0.886			
AQ4				0.881			
AQ5				0.890			
LQ1					0.730		
LQ2					0.778		
LQ3					0.846		
LQ4					0.788		
LQ5					0.704		
LQ6					0.708		
CA1						0.832	
CA2						0.782	
CA3						0.782	
CA4						0.818	
PROF1							0.835
PROF2							0.846
PROF3							0.760
PROF4							0.785
PROF5							0.727

4.6.2. <u>Confirmatory Factor Analysis (CFA)</u>

CFA defines "measurement models," which describe how observed variables represent latent variables. After these measurement models have been reviewed and approved, the study can examine into path models (also referred to as structural models) which connect the latent variables. Earlier, EFA was performed as a primary exploratory stage in the formulation of a measure, which now will be followed by CFA to assess if the structure observed in the EFA fits across a new test. To put it in another perspective, CFA can be employed to confirm the produced EFA factor structure. CFA is a sort of SEM that focuses on measurement models, or the links that exist between observed measurements and factors. The hypothesis-driven nature of CFA is one of its most important characteristics. To summarize, even when using the broader range of practices available with SEM, CFA models frequently are a necessary starting point for comparable analyses. [105]

SEM is broadly known as it offers a quantitative approach for evaluating basic theories and clearly consider for measurement error, which is common in most domains. SEM is a multivariate approach that integrates parts of factor analysis and regression, allowing a study to analyze links between measured variables and latent variables (measurement theory evaluation) as well as between latent variables (evaluation of structural theory). CFA differs from SEM model in that it emphasizes on the interactions between indicators and latent variables, while SEM covers structural or causal paths between latent variables. CFA can be used as a solo analysis or as part of or as a preliminary measure in a SEM examination.[106]

[105] (Brown 2006), (B. Thompson 2000), (B. Thompson 2004), (Harrington 2009)

[106] (Harrington 2009), (Hair, et al. 2017)

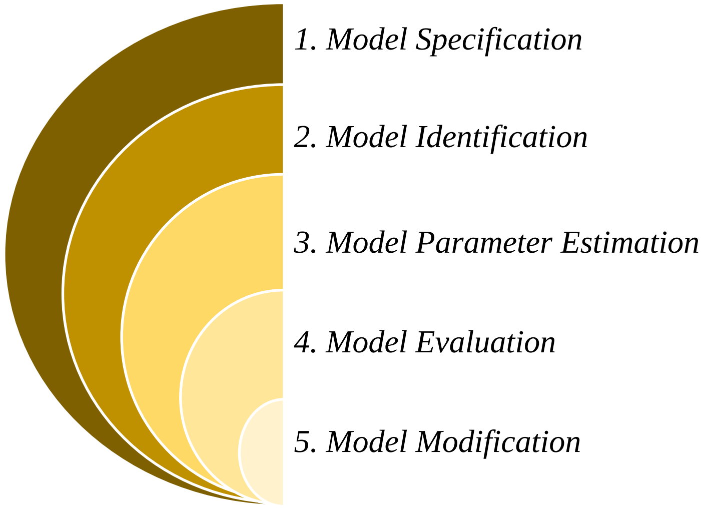

Figure 13 Logical Steps In SEM

SEM consists of five basic procedures: model specification, identification, parameter estimation, model evaluation, and model modification (Kline 2010; Hoyle 2011; Byrne 2013). Model specification describes the hypothesized interactions across variables in SEM relying on one's expertise. Model identification determines whether the model is "over identified", or "under-identified". Model Parameter Estimation is only computed in the "identified" or "over-identified" models. Model evaluation evaluates model fit, using quantitative metrics produced for general goodness of fit. Modification, also known as post-hoc model modification, involves adjusting the model to enhance model fit. Validation involves the process of improving the model's dependability and reliability. SEM is broken into two models: a measurement model as well as a structural model. A measurement model evaluates latent/composite variables, whereas a structural model evaluates all hypothetical dependencies using path analysis. [107]

Measurement Model

The measurement model which is established first before the structural model evaluates the quality parameters of the constructs, which usually comprise ‘factor loading, Reliability, and

[107] (Kline, Principles And Practice Of Structural Equation Modeling 2015), (R. K. Hoyle 2011), (B. M. Byrne 2013), (R. H. Hoyle 1995)

Validity. Construct validity that is a crucial factor in the assessment of measurement model comprises convergent and discriminant validity. [108]

Construct Validity

Construct validity is the extent whereby reasonable conclusions may be drawn from the study's 'operationalizations' to the theoretical concepts on which those 'operationalizations' are derived. In other words, it is the fundamental premise of validity, pertaining to the extent to which the study variables faithfully measure the concept that they are supposed to measure. As a result, to assess the construct validity two types of measurements were implemented: convergent validity and discriminant validity. This study statistically applied PLS-SEM, to establish construct validity.[109]

Convergent validity

The outputs of CFA provide strong confirmation of theoretical constructs' - convergent and discriminant validity. Demonstrating that various indicators of theoretically identical or comparable constructs are highly connected which indicates convergent validity. Convergent validity is verified by substantial correlations across methods evaluating the same attribute. [110]

This study used AVE values to assess convergent validity. According to (Fornell and Larcker 1981) when AVE value is below .50, the variation attributed to measurement error is more than the variance covered by the studies construct, hence underlying validity of both the individual indicators and the construct is put under question. A constructs convergent validity is established when AVE values are equal or greater than .50, which explains items in the study converge to evaluate an underlying construct. The study applied a .50 AVE Value threshold to establishe convergent validity. Table 21 below shows the convergent validity results based on AVE estimations for each of the constructs. The result shows that all constructs have AVE values that is greater that .50. Hence convergent validity is established and is not an issue.

[108] (Fawad 2022)

[109] (Brown 2006), (Somekh and Lewin 2005), (Trochim, Donnelly and Arora 2016)

[110] (Brown 2006)

Table 20 Construct Convergent Validity (AVE)[111]

	Average Variance Extracted (AVE)
Loan Sale	0.762
Loan Syndication	0.739
Securitization	0.614
Moral Hazard	0.745
Adverse Selection	0.716
Asset Quality	0.721
Liquidity	0.579
Capital Adequacy	0.646
Profitability	0.627

Discriminant validity

Discriminant validity reflects how original or different a measure is. To establish a discriminant validity a scale must not be too correlated with a measure of construct that is different. In other words, discriminant validity is established when two variables are anticipated to be uncorrelated by theory and the scores acquired by measuring them are empirically shown to be so. [112]

There are three different methods to which the study adopted to establish discriminant validity. By using the Smartpls software the study assessed discriminant validity through the Fornell and Larcker Criterion, Cross Loadings, and Heterotrait-Monotrait Ratio (HTMT).

Fornell and Larcker Criterion

The Fornell and Larcker criterion for establishing Discriminant Validity was suggested by (Fornell and Larcker 1981). They argued that when a latent variable consists significantly more variation in its related indicator variables than other constructs in the similar model, then the

[111] Source: Analysis of survey data using Smart PLS 3

[112] (Zikmund, Babin and Jon C. Carr 2009), (Sekaran and Bougie 2016), (Harrington 2009)

construct has discriminant validity. To meet this criterion, AVE of each construct must be compared to its "squared correlations with other constructs in the model". [113]

Table 22 below shows the square root of each individual constructs AVE value (in ***Bold & Italic***). These values are greater than the correlating values with other constructs stated under each AVE Value. Accordingly, the result provided that based on the assessment of Fornell and Larcker criterion, there is substantial evidence for the establishment of discriminant validity.

Table 21 Discriminant Validity - Fornell & Larcker Criterion[114]

	LSA	LSY	SEC	MH	AS	AQ	LQ	CA	PROF
Loan Sale	***0.873***								
Loan Syndication	0.356	***0.860***							
Securitization	0.114	0.122	***0.783***						
Moral Hazard	0.180	0.171	0.175	***0.863***					
Adverse Selection	0.200	0.108	0.039	0.367	***0.846***				
Asset Quality	0.169	0.170	0.137	0.209	0.269	***0.849***			
Liquidity	0.198	0.184	0.155	0.369	0.258	0.387	***0.761***		
Capital Adequacy	0.190	0.134	0.145	0.338	0.276	0.306	0.692	***0.804***	
Profitability	0.153	0.167	0.039	0.192	0.078	0.356	0.465	0.406	***0.792***

Note: ***Bold and Italics*** represent the square-root of AVE.

Cross Loadings

The examination of cross-loadings, also known as "item-level discriminant validity," is another notable method for determining discriminant validity. Discriminant validity is demonstrated where any of the measurement item correlates poorly against all other constructs excluding the one to which it is conceptually related. This technique might well be linked prior to EFA assessment carried out, in which the study investigated indicator loading patterns to discover

[113] (Henseler, Ringle and Sarstedt 2015), (Fornell and Larcker 1981)

[114] Source: Analysis of survey data using Smart PLS 3

indicators having strong loadings on the same factor as well as those with strong loadings on many factors. In PLS (Barclay, Higgins and Thompson 1995) and (Chin 1998) were among the first to suggest that each indicator loading must be higher than all cross-loadings. They argued that if the indicator loading is not larger than compared to all other cross-loadings then the measure in concern is unable to discern whether it belongs to the construct it was designed to measure or to another which reflects discriminant validity problem.[115]

Table 23 below shows each items factor loading across all the constructs. The cross-loading assessment result shows that factor loading of each item is strong in its respective parent construct compared to the other constructs in the study. Accordingly, the result provided that based on the assessment of cross-loadings, there is substantial evidence for the establishment of discriminant validity.

Table 22 Discriminant Validity - Cross Loadings[116]

	LSA	LSY	SEC	MH	AS	AQ	LQ	CA	PROF
LSA1	0.736	0.274	0.206	0.022	0.040	0.227	0.174	0.134	0.159
LSA2	0.879	0.356	0.103	0.155	0.139	0.198	0.182	0.151	0.138
LSA3	0.906	0.331	0.080	0.108	0.134	0.180	0.186	0.189	0.161
LSA4	0.899	0.273	0.095	0.224	0.284	0.112	0.169	0.163	0.083
LSA5	0.916	0.314	0.077	0.216	0.245	0.099	0.168	0.197	0.129
LSA6	0.887	0.322	0.067	0.178	0.158	0.100	0.166	0.153	0.146
LSY1	0.382	0.872	0.075	0.169	0.100	0.147	0.201	0.196	0.154
LSY2	0.346	0.881	0.098	0.130	0.111	0.159	0.129	0.092	0.152
LSY3	0.277	0.854	0.083	0.140	0.043	0.146	0.156	0.084	0.166
LSY4	0.255	0.838	0.105	0.118	0.108	0.128	0.132	0.102	0.078
LSY5	0.249	0.853	0.166	0.167	0.103	0.150	0.161	0.084	0.155
SEC1	0.089	0.150	0.857	0.159	0.010	0.149	0.193	0.155	0.115
SEC2	0.100	0.063	0.694	0.127	0.034	-0.003	0.059	0.036	-0.068
SEC3	0.075	0.057	0.769	0.148	0.033	0.064	0.062	0.102	0.016

[115] (Gefen and Straub 2005), (Mulaik 2009)

[116] Source: Analysis of survey data using Smart PLS 3

SEC4	0.122	0.119	0.751	0.103	0.056	0.169	0.100	0.092	-0.003
SEC5	0.075	0.052	0.835	0.146	0.035	0.087	0.128	0.132	0.006
MH1	0.103	0.125	0.190	0.851	0.360	0.186	0.326	0.286	0.153
MH2	0.211	0.203	0.166	0.851	0.438	0.151	0.307	0.294	0.153
MH3	0.146	0.127	0.132	0.873	0.290	0.169	0.312	0.261	0.152
MH4	0.132	0.150	0.155	0.865	0.183	0.220	0.329	0.301	0.208
MH5	0.182	0.129	0.109	0.874	0.315	0.174	0.316	0.315	0.157
AS1	0.100	0.100	-0.013	0.418	0.857	0.183	0.240	0.254	0.010
AS2	0.119	0.060	0.024	0.368	0.831	0.095	0.189	0.189	0.046
AS3	0.231	0.103	0.078	0.264	0.859	0.255	0.224	0.213	0.083
AS4	0.196	0.094	0.033	0.236	0.837	0.316	0.215	0.265	0.106
AQ1	0.091	0.073	0.095	0.171	0.295	0.802	0.287	0.255	0.195
AQ2	0.102	0.092	0.118	0.188	0.143	0.780	0.332	0.285	0.282
AQ3	0.196	0.189	0.096	0.163	0.183	0.886	0.292	0.212	0.332
AQ4	0.140	0.143	0.153	0.183	0.260	0.881	0.316	0.260	0.329
AQ5	0.178	0.206	0.117	0.188	0.245	0.890	0.412	0.295	0.360
LQ1	0.071	0.212	0.113	0.279	0.160	0.371	0.730	0.450	0.374
LQ2	0.121	0.182	0.122	0.321	0.232	0.307	0.778	0.484	0.352
LQ3	0.189	0.136	0.066	0.409	0.303	0.261	0.846	0.564	0.356
LQ4	0.172	0.115	0.145	0.281	0.164	0.270	0.788	0.573	0.331
LQ5	0.166	0.109	0.179	0.104	0.100	0.325	0.704	0.481	0.371
LQ6	0.202	0.068	0.131	0.172	0.146	0.275	0.708	0.643	0.372
CA1	0.202	0.045	0.129	0.266	0.188	0.258	0.648	0.832	0.359
CA2	0.046	0.040	0.137	0.213	0.150	0.329	0.551	0.782	0.369
CA3	0.142	0.182	0.101	0.244	0.106	0.286	0.580	0.782	0.388
CA4	0.181	0.144	0.107	0.328	0.361	0.171	0.482	0.818	0.245
PROF1	0.118	0.153	0.005	0.221	0.064	0.293	0.441	0.348	0.835
PROF2	0.131	0.172	0.033	0.198	0.128	0.325	0.443	0.388	0.846
PROF3	0.161	0.163	0.132	0.049	0.017	0.347	0.279	0.278	0.760
PROF4	0.135	0.031	-0.004	0.104	0.045	0.185	0.333	0.278	0.785
PROF5	0.042	0.081	-0.030	0.134	0.007	0.205	0.266	0.273	0.727

Heterotrait-Monotrait Ratio (HTMT)

The last discriminant validity assessment was conducted by using the Heterotrait-Monotrait Ratio (HTMT). (Henseler, Ringle and Sarstedt 2015) proposed a new method for testing discriminant validity. The 'heterotrait-monotrait ratio of correlations' is a metric of latent variables similarity. In comparison to the cross-loading criteria, HTMT is suggested because it can attain greater specificity and sensitivity. Discriminant validity is considered proven if the HTMT is demonstrably less than one. A threshold of 0.85 effectively identifies those pairings of latent variables which have been discriminant valid from those that are not in several scenarios. Other scholars like (Kline 2011) proposed a cut-off value of 0.85 or less whereas (Teo, Srivastava and Jiang 2008) suggest a cut-off value of 0.9. This study by taking into considerations the various scholar's argument applied a 0.85 threshold ratio for HTMT assessment. [117]

Table 24 below shows the HTMT ratio of correlations for each variable. Accordingly, the result shows that the ratio of each variable is less than the accepted threshold value of 0.85. Hence, the result provides based on the assessment of HTMT ratio of correlations, there is substantial evidence for the establishment of discriminant validity.

Table 23 Discriminant Validity - HTMT[118]

	LSA	LSY	SEC	MH	AS	AQ	LQ	CA	PROF
Loan Sale									
Loan Syndication	0.381								
Securitization	0.137	0.128							
Moral Hazard	0.192	0.184	0.197						
Adverse Selection	0.213	0.118	0.059	0.426					
Asset Quality	0.187	0.182	0.141	0.231	0.280				
Liquidity	0.227	0.200	0.172	0.387	0.277	0.449			
Capital Adequacy	0.201	0.145	0.166	0.374	0.287	0.377	0.843		
Profitability	0.168	0.168	0.106	0.199	0.090	0.383	0.526	0.485	

[117] (Henseler, Ringle and Sarstedt 2015), (Kline 2011), (Teo, Srivastava and Jiang 2008), (Rohana, Ramayah and Rahimah 2018)

[118] Source: Analysis of survey data using Smart PLS 3

Validating Higher Order Construct

As part of the measurement model evaluation, higher-order constructs of this study are also validated. The higher-order constructs are assessed for reliability, convergent validity and discriminant validity as suggested by (Sarstedt, et al. 2019). Financial innovation was the higher-order construct based on three lower order constructs Loan sale, Loan Syndication, and Securitization; whereas another higher order construct information asymmetry is based on two lower order constructs: Adverse selection and Moral Hazard. The study used the disjoint two-stage approach. This approach takes in to account only the lower-order components of the higher order construct in the path model. To carry on with this approach the study captured the latent variables construct scores of the lower order components. The higher order reflective-reflective and reflective-formative construct depicted under fig 1 is examined for results of reliability and validity. Table 24 below shows Construct Reliability and Convergent Validity assessment carried out on only the reflective-reflective constructs, (i.e., financial innovation and information asymmetry).[119]

Table 24 Reflective Higher-Order Construct Reliability and Convergent Validity

	Cronbach's Alpha	Composite Reliability	(AVE)
Financial Innovation	0.755	0.843	0.578
Information Asymmetry	0.720	0.811	0.681
Bank Performance	-	-	-

Cronbach's Alpha results ranged from .720 to .755, while Composite Reliability results were between .811 and .843. The reliability statistics for both indices of reliability are higher than the acceptable threshold of .70 (Hair, Ringle, Sarstedt, & G. Tomas, 2011). As a result, construct reliability has been formed for the higher order reflective-reflective construct. Convergent validity results are also shown based on the AVE estimations for each of the constructs. The result shows that all constructs have AVE values that is greater than .50. Hence convergent validity is established and is not an issue.

[119] (Sarstedt, et al. 2019), (Hair, et al. 2017)

For the reflective-formative construct the higher order construct Bank performance based on four lower order constructs: Asset Quality, Liquidity, Capital Adequacy, and Profitability was assessed. To establish construct validity for the reflective-formative higher order construct Outer weights, Outer Loadings, and VIF are considered.

Table 25 below shows the assessment caried out on formative HOC. As it is indicated by (Hair, et al. 2017) in Fig 14 and Fig 15, to assess the validity of formative HOC: Outer Weight, T-Statistics, P Values, Outer Loadings, and VIF values are considered. Accordingly, the first step in establishing validity for the formative HOC is assessing Outer Weight. (Hair, et al. 2017) argued that "unlike reflective measurement models, in which the number of indicators has no impact upon its measurement outputs, formative measurement has a built-in limitation on the number of indicators that can maintain statistically significant weight". In other words, with an increasing number of formative indicators that is used to assess individual construct, it results in a greater possibility of one or more indicators to have poor or non-significant out weights. Hence a formula $1/\sqrt{n}$ is used to get the maximum possible outer weight, where n is the number of indicators. As a result, this study maximum possible outer weight is $\frac{1}{\sqrt{4}} = 0.5$. Accordingly, all the four indicators below in Table 25 have an outer weight of 0.404, 0.474, 0.418, and 0.448. The outer weight assessments were found to be significant.

The second step which is analyzing formative indicators outer loading as indicated in Fig 15 was also assessed. (Hair, et al. 2017) proposed a cut-off value of >0.5 for each lower-order construct. Accordingly, as shown in Table 25 each lower-order construct has an Outer loading value of >0.5 (0.683, 0.877, 0.833, and 0.613). Hence, Outer Loading were found to be absolutely important.

Finally, to check for collinearity issues in the formative HOC, VIF values were assessed. (Hair, et al. 2017) recommended that each lower-order indicator to have a VIF value lower than 5. As it is indicated in Table 25, each lower-order indicator has a VIF value that is <5 (1.235, 2.16, 1.953, and 1.358). Hence, no critical level of collinearity was found.

Since all the validity assessment caried out on the formative higher-order construct are satisfied, then the formative HOC validity was established.

Table 25 Higher-Order Formative Construct Validity[120]

HOC	LOCs	Outer Weight	T Statistics	P Values	Outer Loadings	VIF
Bank Performance	AQ	0.404	2.361	0.018	0.683	1.235
	LQ	0.474	2.709	0.007	0.877	2.16
	CA	0.418	2.737	0.006	0.833	1.953
	PROF	0.448	3.938	0.002	0.613	1.358

Fig 14 – Fig 15 [121-122]

Figure 15 Decision-Making Process for Keeping or Deleting Formative Indicators

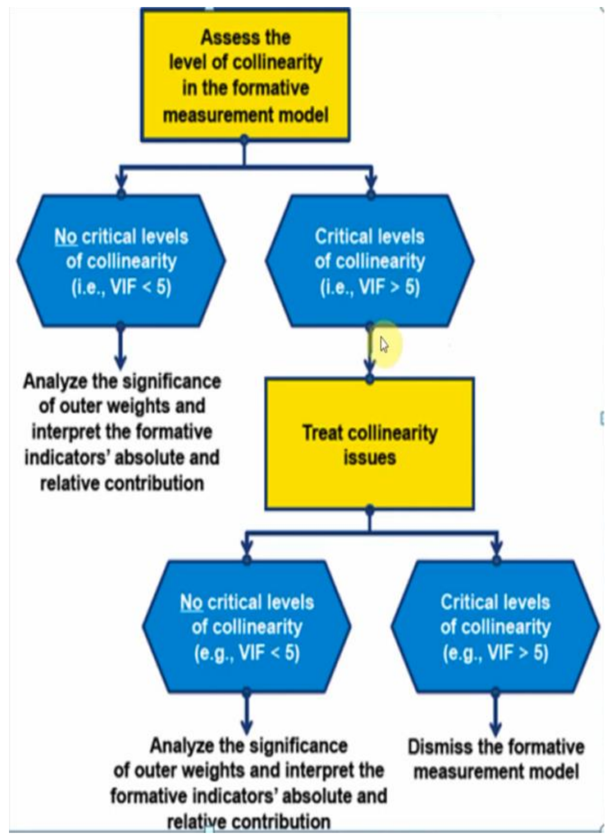

Figure 15 Assessment of Significance and Relevance of Formative Indicators

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120 Source: Analysis of survey data using Smart PLS 3

121 (Hair, et al. 2017)

122 ibid

After the establishment of validity for the formative HOC, the study further evaluated the reflective HOC (financial innovation and information assymetry) discriminant validity. To assess discrimnant validity the study carried on with (Fornell and Larcker 1981) criterion, cross-loadings, and HTMT ratio of correlation assessment.

The Fornell and Larcker 1981 criterion assesment as indicated in Table 26 below shows the square root of each individual constructs AVE value (in Bold & Italic). These values are greater than the correlating values with other constructs stated under each AVE Value. Accordingly, the result provided that based on the assessment of Fornell and Larcker criterion, there is substantial evidence for the establishment of discriminant validity for the reflective HOC.

Table 26 Fornell and Larcker 1981 criterion - Reflective HOC Discriminant Validity[123]

	Financial Innovation	**Information Asymmetry**	**Bank Performance**
Financial Innovation	***0.760***		
Information Asymmetry	0.266	***0.825***	
Bank Performance	0.299	0.438	

The cross-loadings assesment as indicated in Table 27 below shows each items factor loading across all the constructs. The cross-loading assessment result shows that factor loading of each item is strong in its respective parent construct compared to the other constructs in the study. Accordingly, the result provided that based on the assessment of cross-loadings, there is substantial evidence for the establishment of discriminant validity for the HOC.

Table 27 Cross-Loadings - HOC Discriminant Validity[124]

	Financial Innovation	**Information Asymmetry**	**Bank Performance**
LSA	0.785	0.228	0.229
LSY	0.720	0.172	0.199
SEC	0.529	0.137	0.185
MH	0.254	0.860	0.383
AS	0.181	0.791	0.339
AQ	0.232	0.286	0.691

[123] Source: Analysis of survey data using Smart PLS 3

[124] Source: Analysis of survey data using Smart PLS 3

LQ	0.262	0.385	0.878
CA	0.230	0.374	0.828
PROF	0.181	0.169	0.456

The HTMT assesment as indicated in Table 28 below shows the HTMT ratio of correlations for each reflectve construct. Accordingly, the result shows that the ratio of each variable is less than the accepted threshold value of 0.85. Hence, the result provided that based on the assessment of HTMT ratio of correlations, there is substantial evidence for the establishment of discriminant validity for the reflective HOC.

Table 28 HTMT - Reflective HOC Discriminant Validity[125]

	Financial Innovation	Information Asymmetry
Financial Innovation		
Information Asymmetry	0.541	

4.6.3. Structural Model

The inner model, or structural model, depicts the paths (relation) between the constructs. After the outer models' reliability and validity have been established, additional procedures must be followed to test the hypothesized links inside the inner model. PLS-SEM lacks a standard goodness-of-fit measure when compared to other structural modeling tools, and previous efforts to develop one have proven extremely difficult. The model's quality is instead determined by its capability to anticipate endogenous constructs. This evaluation is supported by the following criteria: coefficient of determination (R^2), predictive-relevance model (Q^2), path coefficients, and effect size (f^2). Further the structural model analysis also includes direct and indirect effects (mediating effects). The structural model confirms the hypothesized relationships significance. [126]

[125] Source: Analysis of survey data using Smart PLS 3

[126] (Henseler and Sarstedt, Goodness-of-fit indices for partial least squares path modeling 2013), (Hair, et al. 2014)

The Mediating Effect of Information Asymmetry on the Relationship Between Financial Innovation and OTD Bank Performance.

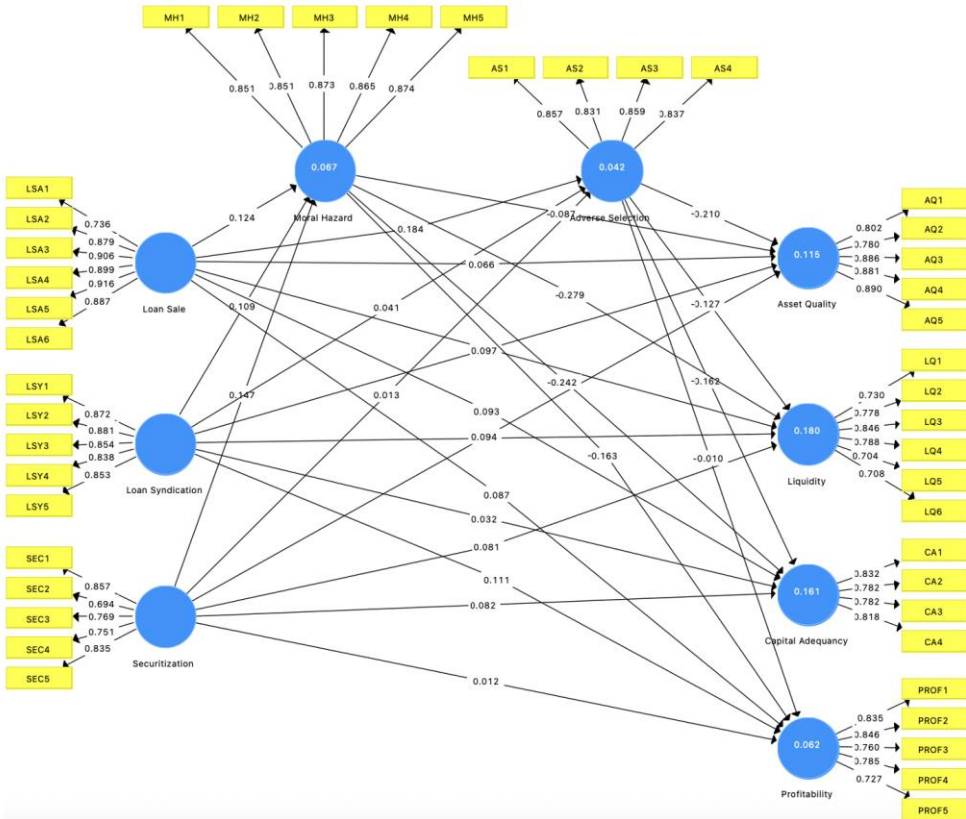

Figure 16 Lower-Order Construct Model of PLS-SEM[127]

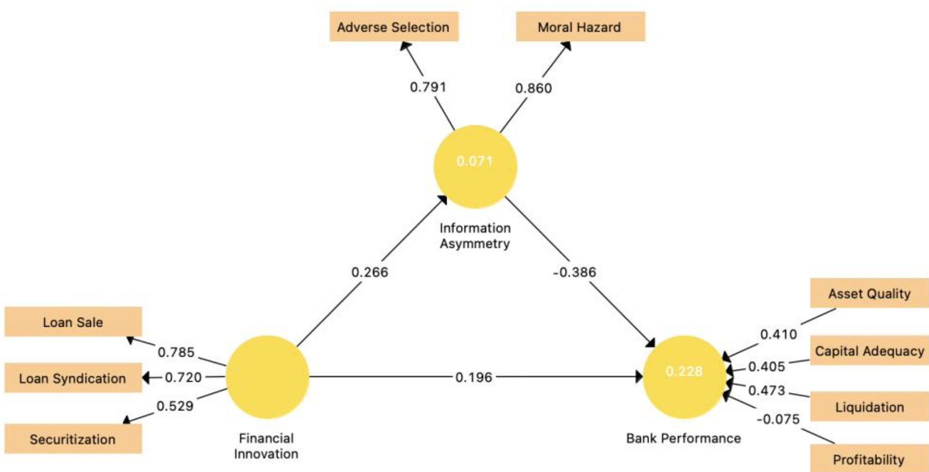

Figure 17 Higher-Order Construct Model of PLS-SEM[128]

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[127] Source: Study PLS-SEM Result

[128] Source: Study PLS-SEM Result

Coefficient of determination (R2)

The determination coefficient (R^2 value) by far is the most often employed statistic to measure the structural model. As such the coefficient is a metric for the evaluation of the model's predictive ability and is determined as the squared correlation between the actual and projected values of a certain endogenous component. The coefficient indicates the sum of the impacts of the external latent variables on endogenous latent variable. Such that, the coefficient is the amount of variation described by entire of the exogenous components connected to it in the endogenous constructs. [129]

The R^2 rating is a scale between 0 to 1, with increasing scores denoting more prediction accuracy. It is however challenging to offer cut-off value for appropriate R^2 rating since they rely mostly on the model's complexity and the field of study. While disciplines consider R^2 values of 0.20 to be high according to (Hair, et al. 2017); other scholars like (Falk and Miller 1992) suggest R^2 value of "≥ 0.10" as adequate. (Cohen 1988) proposed a R^2 value for the endogenous latent variables as '0.2' being substantial, 0.1 being moderate, and 0.02 as being weak. The study used the recommended cut-off value of 0.1. Based on the PLS-SEM analysis as indicated in Fig 16, the result reveals R^2 value for the endogenous variables of lower-order construct (AQ, LQ, CA, & PROF) as 0.115, 0.180, 0.161, and 0.062. The result indicated the lower-order construct model obtained acceptable coefficient of determination that is substantial.

For the higher-order construct as indicated in Fig 17, the endogenous laten variable Bank Performance has R^2 value 0.228, which means 22.8% variance in Bank performance can be attributed to Financial Innovation. For the higher-order construct, the result indicated the model obtained acceptable coefficient of determination that is substantial.

Effect size (f^2)

Besides to assessing the R2 values of endogenous latent variables, the variation in R2 value when a given independent variable is removed from the model may be used to determine if the missing construct has a significant influence on the endogenous constructs. (Cohen 1988) proposed effect size value of ≥ 0.02. As computed by PLS-SEM, effect size for independent

[129] (Hair, et al. 2017)

variable financial innovation resulted in f^2 value of ‘0.046’. The analysis of this study f^2 result shows the removal of ‘Financial innovation’ will have a moderate influence on Bank performance.[130]

Predictive-relevance model (Q^2)

The Q^2 values predicted by the blindfolding technique reflect a measure of how effectively the path model can anticipate the first observed values. The relative impact of predictive relevance may be compared to the q^2 effect size, similar to the f^2 effect size technique for measuring R^2 values. The Q^2 examines whether a model has a predictive relevance or not. A study exogenous construct is said to be well reconstructed and that the model has a predictive relevance when the value of Q^2 is greater than 0 for an established endogenous construct. (Cohen 1988) proposed effect size q^2 value of ≥ 0.02. As computed by PLS-SEM, effect size (Q^2) for predictive-relevance exogenous construct ‘*financial innovation’* on endogenous construct *‘Bank Performance’* resulted in Q^2 value of ‘0.110’. The analysis of this study Q^2 result shows that the independent variable has a moderate effect in producing predictive relevance model.[131]

Standardized Root Mean Square Residual (SRMR)

The squared disparity among the measured correlations and the model-implied correlations is measured by the standardized root mean square residual (SRMR), which (Henseler, Dijkstra, et al. 2014) established as a technique for model validation. (Hu and Bentler 1999) proposed a value below 0.10 or 0.08 for SRMR to consider a model a good-fit. As computed by PLS-SEM, the SRMR for the lower-order construct is 0.061 while for the higher-order construct it is 0.08. Hence the value of SRMR for this study is considered as a good fit.

[130] ibid

[131] ibid

4.6.4. Hypothesis Testing

In ‘Section 1.5’ above, this study made a statement about particular conditions. To find evidence supporting or disputing the statement, data from the sample are used. To establish whether the statement is correct, the study begins by establishing a risk level referred to as the significance level; that will incorrectly draw the conclusion there is an effect when there is none. The term "statistical significance" refers to a metric, or "p-value," that evaluates the likelihood that the results are not just coincidence. Conventional p-values are 0.05, 0.01, and 0.001, which essentially indicate that there is a 5/100, 1/100, or 1/1000 chance that the findings are the result of chance, respectively. The level of significance for this study is usually set at 5%. A P-value that is less than 0.05 indicates that the finding is scientifically important. A P-value between 0.06 and 0.08 indicate a partial significance. From table 29 to table 32 below, the study presents summary of the hypothesis (statements) made by the study. [132]

Table 29 Summery of Hypothesis 1 to be Tested[133]

Hypothesis 1

HYP		β	T Statistics	P-value	Status
H1	***Financial Innovation –> Bank Performance***	***0.196***	***3.244***	***0.001***	***Significant***
H1a	Loan Sale –> Liquidity	0.084	2.385	0.021	*Significant*
	Loan Sale –> Capital Adequacy	0.093	3.569	0.000	*Significant*
	Loan Sale –> Asset Quality	0.066	1.990	0.045	*Significant*
	Loan Sale –> Profitability	0.087	2.044	0.044	*Significant*
H1b	Loan Syndication –> Liquidity	0.083	1.243	0.214	*Insignificant*
	Loan Syndication –> Capital Adequacy	0.032	1.978	0.048	*Significant*
	Loan Syndication –> Asset Quality	0.097	3.675	0.000	*Significant*
	Loan Syndication –> Profitability	0.111	2.123	0.018	*Significant*

[132] (Sarstedt and Mooi 2019), (O’leary 2004), (Dorothy Dickson, M.Sc. Vaccine Testing Center 2018)

[133] Source: Study PLS-SEM Result - (Table 29 – Table 32)

H1c	Securitization –> Liquidity	0.081	2.378	0.023	*Significant*
	Securitization –> Capital Adequacy	0.082	3.572	0.000	*Significant*
	Securitization –> Asset Quality	0.094	1.826	0.066	*Partially Significant*
	Securitization –> Profitability	0.012	2.352	0.021	*Significant*

Table 30 Summery of Hypothesis 2 to be Tested (Mediation Effects Assessment)

Hypothesis 2 (Mediation Effects Assessment)

HYP		β	T Statistics	P-value	Status
H2	***Financial Innovation –> Information Asymmetry –> Bank Performance***	***0.103***	***3.542***	***0.000***	***Significant***
H2a1	Loan Sale –> Adverse Selection –> Liquidity	0.023	1.915	0.057	*Partially Significant*
	Loan Sale –> Adverse Selection –> Capital Adequacy	0.03	1.713	0.087	*Significant*
	Loan Sale –> Adverse Selection –> Asset Quality	0.038	2.102	0.036	*Significant*
	Loan Sale –> Adverse Selection –> Profitability	-0.002	0.135	0.893	*Insignificant*
H2a2	Loan Syndication –> Adverse Selection –> Liquidity	0.005	0.476	0.634	*Insignificant*
	Loan Syndication –> Adverse Selection –> Capital Adequacy	0.007	1.837	0.065	*Partially Significant*
	Loan Syndication –> Adverse Selection –> Asset Quality	0.009	1.752	0.078	*Partially Significant*
	Loan Syndication –> Adverse Selection –> Profitability	-0.000	0.073	0.943	*Insignificant*
H2a3	Securitization –> Adverse Selection –> Liquidity	0.002	0.171	0.864	*Insignificant*
	Securitization –> Adverse Selection –> Capital Adequacy	0.002	0.18	0.857	*Insignificant*
	Securitization –> Adverse Selection –> Asset Quality	0.003	0.19	0.849	*Insignificant*

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	Securitization –> Adverse Selection –> Profitability	-0.000	0.028	0.979	*Insignificant*
H2b1	Loan Sale –> Moral Hazard –> Liquidity	0.035	1.985	0.047	*Significant*
	Loan Sale –> Moral Hazard -> Capital Adequacy	0.03	1.878	0.067	*Partially Significant*
	Loan Sale –> Moral Hazard –> Asset Quality	0.011	0.788	0.431	*Insignificant*
	Loan Sale –> Moral Hazard –> Profitability	0.02	1.714	0.086	*Partially Significant*
H2b2	Loan Syndication –> Moral Hazard –> Liquidity	0.03	1.45	0.147	*Insignificant*
	Loan Syndication –> Moral Hazard –> Capital Adequacy	0.026	1.376	0.169	*Insignificant*
	Loan Syndication –> Moral Hazard –> Asset Quality	0.01	0.799	0.424	*Insignificant*
	Loan Syndication –> Moral Hazard –> Profitability	0.018	1.798	0.006	*Significant*
H2b3	Securitization –> Moral Hazard –> Liquidity	0.041	1.894	0.068	*Partially Significant*
	Securitization –> Moral Hazard –> Capital Adequacy	0.036	1.702	0.085	*Partially Significant*
	Securitization –> Moral Hazard –> Asset Quality	0.013	0.736	0.462	*Insignificant*
	Securitization –> Moral Hazard –> Profitability	0.024	2.027	0.015	*Significant*

Table 31 Summery of Hypothesis 3 to be Tested

Hypothesis 3

HYP		β	T Statistics	P-value	Status
H3	***Financial Innovation –> Information Asymmetry***	***0.266***	***4.864***	***0.000***	***Significant***
H3a	Loan Sale –> Adverse Selection	0.184	2.565	0.010	*Significant*
	Loan Sale –> Moral Hazard	0.124	1.991	0.047	*Significant*

H3b	Loan Syndication -> Adverse Selection	0.041	2.369	0.022	*Significant*
	Loan Syndication -> Moral Hazard	0.109	2.044	0.013	*Significant*
H3c	Securitization -> Adverse Selection	0.013	1.95	0.052	*Partially Significant*
	Securitization -> Moral Hazard	0.147	1.881	0.06	*Partially Significant*

Table 32 Summery of Hypothesis 4 to be Tested

Hypothesis 4

HYP		β	T Statistics	P-value	Status
H4	***Information Asymmetry -> Bank Performance***	***-0.386***	***5.726***	***0.000***	***Significant***
H4a	Adverse Selection -> Liquidity	-0.127	1.97	0.049	*Significant*
	Moral Hazard -> Liquidity	-0.279	3.405	0.001	*Significant*
H4b	Adverse Selection -> Capital Adequacy	-0.162	2.419	0.016	*Significant*
	Moral Hazard -> Capital Adequacy	-0.242	3.161	0.002	*Significant*
H4c	Adverse Selection -> Asset Quality	-0.210	3.317	0.001	*Significant*
	Moral Hazard -> Asset Quality	-0.087	1.885	0.061	*Partially Significant*
H4d	Adverse Selection -> Profitability	-0.010	0.368	0.000	*Significant*
	Moral Hazard -> Profitability	-0.163	1.892	0.066	*Partially Significant*

4.7. Findings of Empirical Results

This section discusses the findings of the data analysis reported in this chapter in order to respond to the research questions stated in Chapter 1. At the start of each part, a summary of the hypotheses is provided. This section presents the study's results in the context of the literary works available and reflects on whether or not the results are consistent with those of earlier studies. A summary is then provided to encapsulate this chapter.

The following section presents the findings and effect of ‘Financial Innovation’ (independent variable); and the mediating effect of ‘Information Asymmetry’ (both Adverse Selection and Moral Hazard) on ‘Bank Performance’ (dependent variable).

4.7.1. Financial Innovation

H1: Financial innovation has a positive and significant effect on Bank performance

There are three sub-hypotheses for H1

H1a: Loan Sale has a positive and significant effect on Bank performance.

H1a1: Loan Sale has a positive and significant effect on Liquidity.

H1a2: Loan Sale has a positive and significant effect on Capital Adequacy.

H1a3: Loan Sale has a positive and significant effect on Asset Quality.

H1a4: Loan Sale has a positive and significant effect on Profitability.

H1b: Loan Syndication has a positive and significant effect on Bank performance.

H1b1: Loan Syndication has a positive and significant effect on Liquidity

H1b2: Loan Syndication has a positive and significant effect on Capital Adequacy.

H1b3: Loan Syndication has a positive and significant effect on Asset Quality

H1b4: Loan Syndication has a positive and significant effect on Profitability

H1c: Securitization has a positive and significant effect on bank performance.

H1c1: Securitization has a positive and significant effect on Liquidity

H1c2: Securitization has a positive and significant effect on Capital Adequacy.

H1c3: Securitization has a positive and significant effect on Asset Quality

H1c4: Securitization has a positive and significant effect on Profitability

Table 33 Result for hypothesis 1[134]

Hypothesis 1

HYP		β	T Statistics	P-value	Status
H1	***Financial Innovation –> Bank Performance***	***0.196***	***3.244***	***0.001***	***Significant***
H1a	Loan Sale –> Liquidity	0.084	2.385	0.021	*Significant*
	Loan Sale –> Capital Adequacy	0.093	3.569	0.000	*Significant*
	Loan Sale –> Asset Quality	0.066	1.990	0.045	*Significant*
	Loan Sale –> Profitability	0.087	2.044	0.044	*Significant*
H1b	Loan Syndication –> Liquidity	0.083	1.243	0.214	*Insignificant*
	Loan Syndication –> Capital Adequacy	0.032	1.978	0.048	*Significant*
	Loan Syndication –> Asset Quality	0.097	3.675	0.000	*Significant*
	Loan Syndication –> Profitability	0.111	2.123	0.018	*Significant*
H1c	Securitization –> Liquidity	0.081	2.378	0.023	*Significant*
	Securitization –> Capital Adequacy	0.082	3.572	0.000	*Significant*
	Securitization –> Asset Quality	0.094	1.826	0.066	*Partially Significant*
	Securitization –> Profitability	0.012	2.352	0.021	*Significant*

According to the model's findings, there is a statistically significant positive relationship between financial innovation and bank performance. The result indicated in Table 33 shows the hypothesized relationship has a 0.196 path coefficient at p-value less than 0.001. The conclusion drawn from the finding is that there is a direct link between financial innovation and bank performance, or that financial innovation directly influences bank performance. Consequently, the study accepts the hypothesis that states financial innovation has a positive and significant effect on bank performance. The result of the hypothesis is consistent with other studies that have used financial innovation in terms of product, process, and institutional innovation types and found a significant positive implication on bank performance (Zouari and Abdelmalek 2020;

[134] Source: SmartPLS 3 Output

Ciciretti, Hasan and Zazzara 2009; Mustapha 2018; Lotto 2019; Chipeta and Muthinja 2018). Therefore, consistent with the findings of the studies indicated **hypothesis H1** is accepted.

H1a: Loan Sale has a positive and significant effect on Bank performance.

The proposed model was emperically examined using structural equation modeling (SEM) by making use of SmartPLS 3 which is a professional statistical software. According to the result indicated in table 33 above there is a significant and positive relationship between the first type of financial innovation (i.e., Loan Sale) and the four determinants of bank performance (i.e., Liquidity, Capital Adequacy, Asset Quality, and Profitability). From the result shown above the path coffecient (β) and p-value (p) for the relationship between loan sale and liquidity, loan sale and capital adequacy, loan sale and asset quality, loan sale and profitability are about 0.084(β) at 0.021(p), 0.093(β) at 0.000(p), 0.066(β) at 0.045(p), and 0.087(β) at 0.044(p), respectively.

The result of the hypothsesis is consistent with other studies findings. According to (Irani and Meisenzahl 2017) there is a significant level of positive relationship between banks selling loans and liquidity management goals. There study finding suggest that loan sales plays an important role in banks liquidy management. Therefore the result of this hypothesis is consistent with (Irani and Meisenzahl 2017) findings; as such **hypothesis H1a1** is accepted.

The relationship loan sale has with capital adequacy was also examined under hypothesis H1a2 using structural equation modeling (SEM). The hypothesis result was also found to be consistent with other studies findings. Accordingly, (Karaoglu 2005) investigated if banks manage regulatory capital (capital adequacy) through loan sales and provided evedience that banks engage in loan sales activity to manage their capital adequacy position and earn in the process, which supports the result of this hypothesis that loan sale has a positive and significant effect on capital adequacy. Therefore the result of this hypothesis is consistent with (Karaoglu 2005) findings; as such **hypothesis H1a2** is accepted.

Hypothesis H1a3 that states loan sale has a positive and significant effect on asset quality was also assessed. According to the hypothesis result which indicates a positive and significant effect, the result was analyzed for consistency with other studies. As such, (Demsetz 2000) investigated the motivation for banks to sell and buy loans, in which the study finding implied that asset quality significantly improves a bank's capacity to sell loans. The author argument to the finding relies on the diversification hypothesis the study made, which explains that banks who lack the ability to diversify quality portfolios internally utilize loan sales; which practically means that banks who lacks internal capacity to raise and hold quality assets sell loans under their portfolios in order to diversify the portfolio and hold more quality assets. The study also makes the statement that a solid reputation for credit quality may facilitate access to the secondary market, particularly for loan sellers. In general, the study identifies that loan sell supports banks in holding and increasing their asset quality performance which supports the result of this hypothesis that loan sale has a positive and significant effect on asset quality. Therefore, the result of this hypothesis is consistent with (Demsetz 2000) findings; as such **hypothesis H1a3** is accepted.

The final assumption made under H1a category was that loan sale has a positive and significant effect on banks profitability which was assessed under hypothesis H1a4. According to the hypothesis result which indicates a positive and significant effect, the result was analyzed for consistency with other studies. As such, (Pavel and Phillis 1987) empirically analyzed the loan sale theory and predicted whether a bank would sell loans continuously throughout the year, occasionally throughout the year, or never, as well as the monetary value a bank would sell. The study found that loan sales increase the overall safety of the bank system and enables banks to diversify their portfolios, which will increase the safety of individual banks, and their profitability from what they do best—originating and servicing loans—rather than storing them; which supports the result of this hypothesis that loan sale has a positive and significant effect on profitability. Therefore, the result of this hypothesis is consistent with (Pavel and Phillis 1987) findings; as such **hypothesis H1a4** is accepted.

H1b: Loan Syndication has a positive and significant effect on Bank performance.

According to the result indicated in table 33 above there is a significant and positive relationship between the secound type of financial innovation (i.e., Loan Syndication) and the three out of four determinants of bank performance (i.e., Capital Adequacy, Asset Quality, and Profitability). From the result, the path coffecient (β) and p-value (p) for the relationship between loan syndication and capital adequacy, loan syndication and asset quality, loan syndication and profitability are about 0.032 (β) at 0.048(p), 0.097(β) at 0.000(p), and 0.111(β) at 0.018(p), respectively. Liquidity was obsereved to have the expected sign (i.e., positive relationship) with loan syndication albeit not statistically significant with a path coffecient (β) and p-value (p) of 0.083(β) and 0.214(p) respectively.

The result of the hypothsesis is consistent with other studies findings. According to (Altunbaş and Kara 2011) study, which examined the factors that influence a bank's participation in loan syndication; there is a positive association between banks participating in syndicating a loan and their liquidity position although it was not statistically significant, which supports the result of the hypothesis. Since the proposition made by this study state that loan syndication has a positive and significant effect on liquidity and the hypothesis result being consistent with (Altunbaş and Kara 2011) findings; **hypothesis H1b1** is not accepted.

The relationship loan syndication has with capital adequacy was also examined under hypothesis H1b2. The hypothesis result was also found to be consistent with other studies findings. Accordingly, (Dennis and Mullineaux 2000) empirically investegated the elements for a banks decision to syndicate a loan. According to the study, loan syndication is also driven by capital adequacy regulations since it allows banks to reduce their exposure to borrowers while still meeting regulatory capital requirements and partially diversify their loan portfolio. The findings of the study mentioned supports the result of this hypothesis that loan syndication has a positive and significant effect on capital adequacy. Therefore, the result of this hypothesis is consistent with (Dennis and Mullineaux 2000) findings; as such **hypothesis H1b2** is accepted.

Hypothesis H1b3 that states loan syndication has a positive and significant effect on asset quality was also assessed. According to the hypothesis result which indicates a positive and significant effect, the result was analyzed for consistency with other studies. As such (Dennis and Mullineaux 2000) analyzed the loan syndication market and found that the greater the quality of the borrower's information, as represented in credit ratings or listing on a stock market, the greater the portion of its loan that may be syndicated. The study also found that when the agent banks overall portfolio's quality declines, these banks tend to syndicate higher percentages of their commercial loans. This mechanism of sharing risk according to (Nawazish, Birjees and Krishna 2015) and (Hasan and Dridi 2010) which studied the possible difference in asset quality and other variables among conventional, Islamic banking, and non-banking institutions; Shariah compliant banks which are asset-based banking thence allowing risk-sharing tend to show a higher superiority in asset quality and financial stability than conventional banks which are debt product banking that allows risk transferring. As such, agent banks with a bad loan portfolio can engage in loan syndication to activate its risk sharing nature whereby they can better the quality of their asset. Since the proposition made by the studies reflect that loan syndication has a positive and significant effect on asset quality, **hypothesis H1b3** is accepted.

The final assumption made under H1b category was that loan syndication has a positive and significant effect on banks profitability which was assessed under hypothesis H1b4. One of the motives for banks to syndicate a loan is the opprtunity to involve in earning fee incomes and interest margins. These fee incomes that are regarded as off-balance sheet earning increase the all-in-all profitability of the proceedings ROA (return on asset) of the participants (Fight 2004). Loan syndication fees are recognized as income once the syndication is completed (ABC Bank Group 2020). For these services, the agent obtains a fee from 10 to 40 basis points as a percentage of the facility, which varies (Dennis and Mullineaux 2000). Since the proposition made by the studies reflect that loan syndication has a positive and significant effect on profitability, **hypothesis H1b4** is accepted.

H1c: Securitization has a positive and significant effect on Bank performance.

According to the result indicated in table 33 above there is a significant and positive relationship between the third type of financial innovation (i.e., Securitization) and the four determinants of bank performance (i.e., Liquidity, Capital Adequacy, Asset Quality, Profitability). From the result, the path coffecient (β) and p-value (p) for the relationship between Securitization and Liquidity, Securitization and capital adequacy, Securitization and asset quality, Securitization and Profitability are about 0.081(β) at 0.023(p), 0.082(β) at 0.000(p), 0.094(β) at 0.066(p), and 0.012(β) at 0.021(p) respectively.

The result of the hypothsesis is consistent with other studies findings. According to (Loutskina 2011) study, which examined how securitization changed the way banking operates, the study found that; by enabling banks to turn unmarketable, difficult-to-sell loans into marketable securities, securitization generates a new source of liquidity. The study reveals that securitization gives deposit institutions a useful pathway to transform illiquid loans into liquid securities in which securitization serves as a replacement for banks' on-balance sheet liquidity. In terms of managing liquidity, it lessens the advantages of big banks, allowing the liquidity levels of small and big banks to converge. The study also confirms the capacity of banks to securitize has grown to be a crucial component of their liquidity-risk management. With the support of the emperical study suggested, there is a positive and significant relationship between banks securitizing a loan and their liquidity position which supports the result of the hypothesis. Since the hypothesis result is consistent with (Loutskina 2011) and (Ambrose, LaCour-Little and Sanders 2005) findings; **hypothesis H1c1** is accepted.

The relationship securitization has with capital adequacy was also examined under hypothesis H1c2. The hypothesis result was also found to be consistent with other studies findings. Accordingly, (Abdelsalam, et al. 2020) empirically investegated the influence of different contractual forms of asset securitizations on the financial health of an international sample of commercial banks. Accordingly, the study emperically found that banks with the highest levels of asset securitization activities often had better/higher capital adequacy. In other words, banks that engage in loan securitization activities are very likely to absorb a financial crisis or other unanticipated losses because of the consideration to be above the minimal standards necessary to imply solvency due to their reduction in regulatory capital requirement as regulatory capital arbitrage. The findings of the study mentioned supports the result of this hypothesis that securitzation has a positive and significant effect on capital adequacy. Therefore, the result of this hypothesis is consistent with (Abdelsalam, et al. 2020) and (Ambrose, LaCour-Little and Sanders 2005) findings; as such **hypothesis H1c2** is accepted.

Hypothesis H1c3 that states securitization has a positive and significant effect on asset quality was also assessed. According to the hypothesis result which indicates a positive and significant effect, the result was analyzed for consistency with other studies. As such (Affinito and Tagliaferri 2010) analyzed using several econometric techniques on Italian individual banks to examines the ex-ante drivers of bank loan securitization. Their study found Banks that are undercapitalized, under profitable, under liquid, and loaded with poor quality loans are more likely to securitize early and for a bigger amount. Their empirical findings are consistent with the profitability-enhancing theory of securitization. Since the proposition made by the studies reflect that securitization has a positive and significant effect on asset quality held by banks, **hypothesis H1c3** is accepted.

The final assumption made under H1c category was that securitization has a positive and significant effect on banks profitability which was assessed under hypothesis H1c4. The hypothesis result was also found to be consistent with other studies findings. Accordingly, (Mohamed, Tapas and Simon 2018) studied how securitization influences bank risk and profitability, and how these impacts ultimately determine the securitization's overall influence on bank stability and systemic risk. As such, they found that banks that participate in securitization face a trade-off between profitability and risk. The findings also demonstrate that securitization operations might explain this trade-off, since securitization boosts profitability while raising bank risk-taking. (Casu, et al. 2013) also studied to determine if individual banks' performance improved as a result of securitization. There findings reveal that securitizing banks are more profitable banks with a more diverse funding structure, but with greater funding costs and more credit risk vulnerability. (Bakoush, Abouarab and Wolfe 2019) also assessed the pathways via which securitization affects bank profitability. They found banks profitability is increased through securitization operations. (Ishak, Leon and Usman 2021) studied the effect of securitization on the financial performance of banks. They found that banks increased their profitability by selling their loan receivable assets to the capital market in order to get liquidity. Furthermore, during the last decade, the bank's position as an intermediary among borrowers and savers has shifted dramatically. The findings indicate that asset-backed securities have a considerable positive Return on Assets. Additionally, securitization enhanced the bank's financial performance parameters such as ROA, Loan Loss Provisions (LLP), and Size. Since the proposition made by the studies reflect that securitization has a positive and significant effect on profitability, **hypothesis H1c4** is accepted.

4.7.2. Information Asymmetry (Mediation effect)

H2: Financial innovation has a significant and indirect effect on bank performance via information asymmetry.

There are two sub-hypotheses for H2

H2a: Adverse Selection mediates the relationship between financial innovation and Bank performance.

H2b: Moral Hazard mediates the relationship between financial innovation and Bank performance.

Hypothesis H2a that states adverse selection mediates the relationship between financial innovation and Bank performance has 12 sub-hypotheses. Of these sub-hypotheses 5 were found to have a statistically significant mediation effect relationship (i.e., adverse selection mediating the relationship between loan sale and liquidity [0.023(β) at 0.057(p)], capital adequacy [0.03(β) at 0.087(p)], and asset quality [0.038(β) at 0.036(p)]; and between loan syndication and capital adequacy [0.007(β) at 0.065(p)], and asset quality [0.009(β) at 0.078(p)]). With the majority of sub-hypothesis being statistically insignificant the hypothesis h2a is not accepted.

Hypothesis H2b that states moral hazard mediates the relationship between financial innovation and Bank performance has 12 sub-hypotheses. Of these sub-hypotheses 7 were found to have a statistically significant mediation effect relationship (i.e., moral hazard mediating the relationship between loan sale and liquidity [0.035(β) at 0.047(p)], capital adequacy [0.03(β) at 0.067(p)], and profitability [0.02(β) at 0.086(p)]; between loan syndication and profitability [0.018(β) at 0.006(p)]; and between securitization and liquidity [0.041(β) at 0.068(p)], capital adequacy [0.036(β) at 0.085(p)], and profitability [0.024(β) at 0.015(p)]). With the majority of sub-hypothesis being statistically significant the hypothesis h2b is acceptable.

4.7.3. Financial Innovation and Information Asymmetry

H3: Financial innovation has a positive and significant effect on Information Asymmetry

There are three sub-hypotheses for H3

H3a: Loan Sale has a positive and significant effect on Information Asymmetry.

H3b: Loan Syndication has a positive and significant effect on Information Asymmetry.

H3c: Securitization has a positive and significant effect on Information Asymmetry.

According to the result indicated in table 33 above there is a significant and positive relationship between financial innovation (i.e., Loan Sale, Loan Syndication, and Securitization) and the two types of Information Asymmetry (i.e., Adverse Selection and Moral Hazard). From the result, the path coefficient (β) and p-value (p) for the relationship between loan sale and adverse selection, loan sale and moral hazard are about 0.184 (β) at 0.010(p), and 0.124(β) at 0.047(p) respectively. Since the proposition made by the studies reflect that loan sale has a positive and significant effect on information asymmetry, hypothesis H3a is accepted. For the relationship between loan syndication and adverse selection, and loan syndication and moral hazard; the path coefficient (β) and p-value (p) are about 0.041 (β) at 0.022(p), 0.109(β) at 0.013(p) respectively. Since the proposition made by the studies reflect that loan syndication has a positive and significant effect on information asymmetry, hypothesis H3b is accepted. The path coefficient (β) and p-value (p) for the relationship between securitization and adverse selection, securitization and moral hazard are about 0.013 (β) at 0.052(p), 0.147(β) at 0.06(p) respectively. Since the proposition made by the studies reflect that securitization has a positive and significant effect on information asymmetry, hypothesis H3c is accepted.

4.7.4. Information Asymmetry and Bank Performance

H4: Information Asymmetry has a Negative and significant effect on Bank performance

There are four sub-hypotheses for H4

H4a: Information Asymmetry has a negative and significant effect on Liquidity.

H4b: Information Asymmetry has a negative and significant effect on Capital Adequacy.

H4c: Information Asymmetry has a negative and significant effect on Asset Quality.

H4d: Information Asymmetry has a negative and significant effect on Profitability.

According to the result indicated in table 33 above there is a significant and negative relationship between Information Asymmetry (i.e., adverse selection and moral hazard) and the four determinants of bank performance (i.e., liquidity, capital adequacy, asset quality, and profitability). From the result, the path coefficient (β) and p-value (p) for the relationship between liquidity and adverse selection, liquidity and moral hazard are about -0.127 (β) at 0.049(p), and -0.279(β) at 0.001(p) respectively. Since the proposition made by the studies reflect that information asymmetry has a negative and significant effect on liquidity, hypothesis

H4a is accepted. For the relationship between capital adequacy and adverse selection, and capital adequacy and moral hazard; the path coefficient (β) and p-value (p) are about -0.162 (β) at 0.016(p), -0.242(β) at 0.002(p) respectively. Since the proposition made by the studies reflect that information asymmetry has a negative and significant effect on capital adequacy, hypothesis H4b is accepted. The path coefficient (β) and p-value (p) for the relationship between asset quality and adverse selection, asset quality and moral hazard are about -0.210 (β) at 0.001(p), -0.087(β) at 0.061(p) respectively. Since the proposition made by the studies reflect that information asymmetry has a positive and significant effect on asset quality, hypothesis H4c is accepted. For the relationship between profitability and adverse selection, and profitability and moral hazard; the path coefficient (β) and p-value (p) are about -0.010 (β) at 0.000(p), -0.163(β) at 0.066(p) respectively. Since the proposition made by the studies reflect that information asymmetry has a negative and significant effect on profitability, hypothesis H4d is accepted.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

The main objective of this thesis was to examine the relationship of Financial Innovation on Bank Performance of Ethiopian banks with the mediating role of Information Asymmetry (adverse selection and moral hazard). Based on the analysis and interpretation from chapter four, the following summary, conclusion, and recommendations are presented.

5.1. CONCLUSION

The research aimed to analyze the mediation effect of the ex-ante and ex-post problems arising on the OTD banking models; and the impact, the model has on banks' performance. Under the OTD banking model, three financial innovations were considered: loan sale, loan syndication, and securitization. The paper examined the effect of the three types of financial innovation in the OTD model on the performance of banks. The three innovation types have a direct link with bank performance, or they directly influence bank performance. From the result, Loan sales play an important role in banks' liquidity management. Banks that engage in a loan sales activity manage their capital adequacy position and earn in the process. Banks that lack the internal capacity to raise and hold quality assets also sell loans under their portfolios to diversify the portfolio and hold more quality assets. Loan sales increase the overall safety of the bank system and enable banks to diversify their portfolios, which will increase the safety of individual banks, and their profitability from what they do best—originating and servicing loans—rather than storing them.

Second, loan syndication is also driven by capital adequacy regulations since it allows banks to reduce their exposure to borrowers while still meeting regulatory capital requirements and partially diversifying their loan portfolio. One of the motives for banks to syndicate a loan is the opportunity to involve in earning fee incomes and interest margins. At last, securitization gives deposit institutions a useful pathway to transform illiquid loans into liquid securities in which securitization serves as a replacement for banks' on-balance sheet liquidity. Banks with the highest levels of asset securitization activities often had better/higher capital adequacy and are more likely to securitize early and for a bigger amount when they are undercapitalized, under-profitable, under-liquid, and loaded with poor-quality loans.

The problem of information asymmetry that results in adverse selection and moral hazard risk was also investigated in this paper. From the result, while moral hazard mediates the relationship, the study concludes adverse selection doesn't mediate the relationship between financial innovation and bank performance.

5.2. Recommendations

To channel funds to the private sector to create jobs and growth while decreasing poverty and achieving development goals, innovative financial mechanisms, such as the OTD model in banking, are considered necessary. This study tried to see the performance of Ethiopian banks concerning their position, knowledge, and capability for innovative transactions (financial innovation). From the results of the research, the following recommendations are forwarded.

- To harness the benefit of having a less expensive source of funds, risk diversification, enhanced liquidity, and expanded loan portfolio, banks in Ethiopia should systematically and progressively start adopting loan sales, loan syndication, and securitization innovations.
- To tackle moral hazard problems that are associated with the adoption of the model, Ethiopian banks should lay out techniques and make sure other institutions that can help in controlling the risks are established. For instance, to increase the monitoring incentive of the banks when dealing within the OTD model, banks can provide loan purchasers with an incentive-efficient loan sales contract that can enhance loan sales volume, and therefore its profitability. Other techniques can be to make the credit-distributing bank hold some portion of the credit so that the bank will have the incentive to monitor the borrowers.
- Due to the complexity of securities, institutions like credit rating agencies are crucial in structured finance, and investors are particularly inclined to base their decisions on the opinions of rating agencies.

Direction for Future Research

As this research emphasizes combining financial innovation (Loan sale, syndication, and securitization), Information asymmetry and bank performance that are less commonly investigated concurrently, greater research in this area is clearly required, especially in the context of developing countries.

In addition to this moderating effect of bank size, age, and ownership should also be studied in the relationship between the three financial innovations and banks performance. Other study areas that need to be considered in the future are:

- Heterogeneous Vs. Homogeneous asset securitization – what implications could these two types of securitizations have on the bank performance. Homogeneous asset securitization must be supported by a pool of underlying exposures which are comparable in terms of asset type, taking into consideration the contractual, credit-risk, and prepayment characteristics of the cash flows associated with the asset type. A collection of underlying exposures can only include one kind of asset. The underlying exposures must include legally enforceable commitments with complete recourse for debtors and, if appropriate, guarantors.
- Since the OTD model primarily involves three parties (lender, borrower, and investor) it is essential to look the model from each side. This study examined the relationship from the lender standpoint – its impact on banks performance. Hence investigation through institutional and individual investor perspective should be conducted.
- Conventional / Islamic Banking models – the effect of the OTD model when adopted in the conventional or Islamic banking model should also be studied as both have different structures. For example, Islamic securitization is a type of legal structure that enables the conversion of non-tradable assets into tradable securities, which serves as the economic goal.
- This study only considered the head office of Ethiopian banks, as such future studies should include domestic and international districts, and comparison with and evidence from cross-border countries.

Reference

2020. *Jano Bank, a new investement bank under formation starts selling shares.* October 18. https://addisbiz.com/business-news-/1833-jano-bank-a-new-investement-bank-starts-selling-shares/amp/.

Abata, M. A. 2014. "Asset Quality And Bank Performance: A Study of Commercial Banks in Nigeria." *Research Journal of Finance and Accounting* 5 (18): 39-44.

ABC Bank Group. 2020. *Consolidated Financial Statements and Independent Auditor's Report* . Independent Auditor's Report, ABC Bank Group.

Abdelsalam, Omneya, Marwa Elnahass, Habib Ahmed, and Julian Williams. 2020. "Asset securitizations and bank stability: Evidence from different banking systems." *Global Finance Journal.*

Abir, Mabrouk , and Mamoghli Chokri. 2010. "Is financial innovation influenced by financial liberalization?: evidence from the Tunisian banking industry." *Banks and Bank Systems* 5 (3): 97-111.

Adams, John, Hafiz T. A. Khan, and Robert Raeside. 2014. *Research Methods for Business and Social Science Students (Second Edition).* New Delhi: SAGE Publications.

Adhikary, B. K. 2006. "Nonperforming loans in the banking sector of Bangladesh: Realities and challenges. ." *Bangladesh Institute of Bank Management* 75-95.

Affinito, Massimiliano, and Edoardo Tagliaferri. 2010. "Why do (or did?) banks securitize their loans? Evidence from Italy." *Journal of Financial Stability* (Elsevier B.V.) 6: 189–202.

African Union. 2019. *Ethiopia deposits instruments of ratification of AFCFTA.* April 10. https://au.int/sw/node/36361.

Aftab, Hameed Memon, and Abdul Rahman Ismail. 2014. "SEM-PLS Analysis of Inhibiting Factors of Cost Performance for Large Construction Projects in Malaysia: Perspective of Clients and Consultants." *Scientific World Journal.*

Agarwal, Sumit, Yan Chang, and Abdullah Yavas. 2012. "Adverse selection in mortgage securitization." *Journal of Financial Economics* 640-660.

Ahn, Jung-Hyun, and Regis Breton. 2014. "Securitization, competition and monitoring." *Journal of Banking & Finance* 195–210.

Akello, Milwa johnstone. 2011. "Determinants Of Financial Innovation And Its Impact On Financial Peformance Of Microfinance Institutions In Kenya." *A Research Project Submitted In Partial Fulfillment For The Award Of The Degree Of Master Of Business Administration, School Of Business University Of Nairobi*, October.

Akerlof, George A. 1970. "The Market for "Lemons": Quality Uncertainty and the Market Mechanism." *The Quarterly Journal of Economics* 488-500.

Allen, F., and D. Gale. 1994. *Financial Innovations and Risk Sharing., Cambridge, MA.* London: MIT Press.

Allen, L. 1988. "The determinants of bank interest margins: A note." *Journal of Financial and Quantitative Analysis* 23(2), 231–235.

Allena, Franklin, and Elena Carletti. 2006. "Credit risk transfer and contagion." *Journal of Monetary Economics* 89–111.

Altunbaş, Yener, and Alper Kara. 2011. "Why do banks join loan syndications? The case of participant banks." *The Service Industries Journal* 31 (7): 1063–1074.

Ambrose, B. W., M. LaCour-Little, and A. B. Sanders. 2005. "Does regulatory capital arbitrage, reputation, or asymmetric information drive securitization?" *Journal of Financial Services Research* 28 (1): 113-13.

Anderson, J. C.,, and D. W. Gerbing. 1988. "Structural equation modeling in practice: A review and recommended two-step approach." *Psychological bulletin* 103 (3): 411.

Angbazo, L. 1997. "Commercial bank net interest margins, default risk, interest-rate risk, and off-balance sheet banking." *Journal of Banking and Finance* 21(1), 55–87.

Arnaboldi , Francesca , and Bruno Rossignoli . 2015. "Financial Innovation in Banking." In *Bank Risk, Governance and Regulation*, by Poli F Beccalli E., 127-162. London: Palgrave Macmillan.

Arrow, K.J. 1963. "Uncertainty and the Welfare Economics of Medical Care." *American Economic Review,* 941-973.

Arrow, K.J. 1965. *Aspects of the Theory of Risk-Bearing.* Lecture 3, Helsinki: Yrjo Johansonian Saatio.

Arthur, Keren Naa Abeka. 2017. "The emergence of financial innovation and its governance - a historical literature review." *Journal of Innovation Management* 48-73.

Awang, Z. 2012. *Research methodology and data analysis second edition.* . UiTM Press.

Bajpai, Naval. 2011. *Business Research Methods.* India: Pearson Education.

Baker, T. L. 1994. *Doing social research (2nd ed.).* New York, NY: McGraw-Hill.

Bakoush, M., R. Abouarab, and S. Wolfe. 2019. "Disentangling the impact of securitization on bank profitability." *Research in International Business and Finance* 47: 519-537.

Bannier, Christina E., and Dennis N. Hansel. 2006. "Determinants of banks' engagement in loan securitization." Working Paper Series No. 171, Finance & Accounting, Johann Wolfgang Goethe-Universitat Frankfurt Am Main.

Barclay, D. W., C. A. Higgins, and R. Thompson. 1995. "The Partial Least Squares Approach To Causal Modeling: Personal Computer Adoption And Use As Illustration." *Technology Studies* 2 (2): 285–309.

Barr, Richard S., and Thomas F. Siems. 1994. *Predicting bank failure using DEA to quantify management quality*. Financial Industry Studies Working Paper 94-1, Federal Reserve Bank of Dallas.

Baumgartner, H., and B. Weijters. 2012. "Commentary on "common method bias in marketing: Causes, mechanisms, and procedural remedies." *Journal of Retailing* 88 (4): 563–566.

Beck, T., Chen, T., Lin, C., Song, F. M. 2016. "Financial innovation: The bright and the dark sides." *Journal of Banking and Finance* 72, 28–51.

Bedendo, Mascia, and Brunella Bruno. 2009. "Credit Derivatives Vs. Loan Sales: Evidence from the European Banking Market." In *Financial Innovation in Retail and Corporate*

Banking, by Luisa Anderloni, David T. Llewellyn and Reinhard H. Schmidt, 224-249. UK: Edward Elgar Publishing Limited.

Berger, A. N.,, and R. DeYoung. 1997. "Problem loans and cost efficiency in commercial banks." *Journal of Banking & Finance* 21 (6): 849-870.

Berle, A,, and G Means. 1932. *The Modern Corporation and Private Property*. New Jersey: Transaction Publishers.

Bernanke, B. S., C. S. Lown, and B. M. Friedman. 1991. "The credit crunch." *Brookings Papers on Economic Activity* 205-247.

Berndt, Antje, and Anurag Gupta. 2009. "Moral hazard and adverse selection in the originate-to-distribute model of bank credit." *Journal of Monetary Economics* (ElsevierB.V.) 56: 725–743.

Bhattacharya, S., and A.V. Thakor. 1993. "Contemporary banking theory." *Journal of Financial Intermediation* 3 (1), 2–50.

Bickman, L., and D. J. Rog. 1998. *Handbook of applied social research methods.* CA: Sage Publications.

Bikker, Jacob A., and Jaap W.B. Bos. 2008. *Bank Performance: A theoretical and empirical framework for the analysis of profitability, competition and efficiency.* New York: Routledge international studies in money and banking.

BIS. 1986. *Recent Innovations In International Banking.* Bank For International Settlements.

Blundell-Wignall, Adrian, Paul Atkinson, and Caroline Roulet. 2018. *Globalisation and Finance at the Crossroads. The Financial Crisis, Regulatory Reform and the Future of Banking.* Switzerland: Palgrave Macmillan.

Boomsma, A. 1982. "Robustness of LISREL against small sample sizes in factor analysis models." In *Systems under indirection observation: Causality, structure, prediction (Part I)*, by Wold H, editors Joreskog KG, 149–1. Amsterdam, Netherlands: North Holland.

Boomsma, A. 1985. "Non-convergence, improper solutions and starting values in LISREL maximum likelihood estimation." *Psychometrika* 50 (2): 229–242.

Boot, Arnoud W. A., and Anjan V. Thakor. 2000. "Can Relationship Banking Survive Competition?" *The Journal Of Finance* 679-713.

Bord, Vitaly M., and João A. C. Santos. 2012. "The Rise of the Originate-to-Distribute Model and the Role of Banks in Financial Intermediation." *Economic Policy Review* Vol. 18 (2): 21-34.

Boslaugh, S., and P. A Watters. 2008. *Statistics in a nutshell.* Sebastopol, CA: OReilly Media.

Brown, Timothy A. 2006. "Confirmatory Factor Analysis for Applied Research." In *Methodology in the Social Sciences*, by David A. Kenny. New York: The Guilford Press.

Burns, Robert B., and Richard A. Burns. 2008. *Business Research Methods and Statistics Using SPSS.* London: SAGE Publications.

Busato, Francesco, and Cuono Massimo Coletta. 2017. "A moral hazard perspective on financial crisis." *Banks and Bank Systems* 12 (3): 298-307.

Byrne, B. M. 2013. *Structural equation modeling with Mplus: Basic concepts, applications, and programming.* routledge.

Byrne, Barbara M. 2016. *Structural Equation Modeling with Amos; Basic Concepts, Applications, and Programming.* New York: Routledge.

Cai, Jian, Frederik Eidam, Anthony Saunders, and Sascha Steffen. 2018. "Loan Syndication Structures and Price Collusion." *Available at SSRN: https://ssrn.com/abstract=3250817*, March 13.

Cain, M. K., Zhang, Z., and K. H. Yuan. 2017. "Univariate and multivariate skewness and kurtosis for measuring nonnormality: Prevalence, influence and estimation." *Behavior research methods* 49 (5): 1716-1735.

Casu, Barbara, Andrew Clare, Anna Sarkisyan, and Stephen Thomas. 2013. "Securitization and Bank Performance." *Journal of Money, Credit and Banking* (The Ohio State University) 45 (8): 1617-1658.

Cebenoyan, A. Sinan, and Philip E. Strahan. 2004. "Risk management, capital structure and lending at banks." *Journal of Banking & Finance* (Elsevier B.V.) 28: 19–43.

Cetorelli, Nicola, and Stavros Peristiani. 2012. "The Role of Banks in Asset Securitization." *The Federal Reserve Bank of New York: Economic Policy Review* (The Federal Reserve Bank of New York) 47-63.

Chen, Zhizhen. 2018. "Loan securitization, bank risk, and efficiency." *Thesis submitted in fulfilment of the requirements of the Degree of Ph.D in Finance* (Adam Smith Business School, College of social science, University of Glasgow) 1-192.

Chezum, Brian, and Bradley S. Wimmer. 2000. "Evidence of Adverse Selection from Thoroughbred Wagering." *Southern Economic Journal 66(3)* 700–714.

Chin, WW. 1998. "The partial least squares approach to structural equation modeling." In *Modern Methods for Business Research*, by GA Marcoulides, 295–336. Mahwah, NJ, USA: Erlbaum.

Chipeta, C., and M. Muthinja. 2018. "Financial innovations and bank performance in Kenya: Evidence from branchless banking models." *South African Journal of Economic and Management Sciences*, 21 (1): 1-11.

Chou, Yuan K. 2007. "Modeling Financial Innovation and Economic Growth: Why the Financial Sector Matters to the Real Economy." *The Journal of Economic Education* Vol. 38: pp. 78-91.

Ciciretti, Rocco, Iftekhar Hasan, and Cristiano Zazzara. 2009. "Do Internet Activities Add Value? Evidence from the Traditional Banks." Edited by Western Finance Association. *Journal of Financial Services Research* (Springer) 35 (1): 81-98.

Cohen, J. 1988. "Set correlation and contingency tables." *Applied psychological measurement* 12 (4): 425-434.

Cooper, Donald R., and Pamela S. Schindler. 2014. *Business Research Methods.* New York: McGraw-Hill/Irwin,.

Corbetta, Piergiorgio. 2003. *Social Research: Theory, Methods And Techniques.* Oxford: SAGE Publications.

Creswell, John W. 2009. *Research Design: Qualitative, Quanitative and Mixed Method Approach.* USA: Sage Publication.

Dahiya, Sandeep, Manju Puri, and Anthony Saunders. n.d. "Bank Borrowers and Loan Sales: New Evidence on the Uniqueness of Bank Loans." *The Journal of Business* 76 (4): 563–582.

Demirguc-Kunt, A. 1989. "Deposit-Institution Failures: A Review Of Empirical Literature." *Economic Review* (Federal Reserve Bank of Cleveland) 25 (4): 2-18.

Demsetz, R. S. 2000. "Bank loan sales: A new look at the motivations for secondary market activity,." *Journal of Financial Research* (Federal Reserve Bank of New York) 23 (2): 197-222.

Dennis, Steven A., and Donald J. Mullineaux. 2000. "Syndicated Loans." *Journal of Financial Intermediation* 404–426.

Diamond, D. W. 1984. "Financial intermediation and delegated monitoring." *Review of Economic Studies* 51 (3), 393–414.

Ding, L.,, W. F., Velicer, and L. L. Harlow. 1995. "Effects of estimation methods, number of indicators per factor, and improper solutions on structural equation modeling fit indices. Structural Equation Modeling." *A Multidisciplinary Journal* 2 (2): 119-143.

Dorothy Dickson, M.Sc. Vaccine Testing Center. 2018. *The Significance Delusion: Inconvenient Truths about P-values.* Research Tapas, The University of Vermont, Larner college of medicine.

Dowd, Kevin. 1999. "Does asymmetric information justify bank capital adequacy regulation?" *Cato Journal* 19 (1).

Drucker, Steven, and Manju Puri. 2006. "Banks in capital markets: A Survey." In *Handbook in Corporate Finance: Empirical Corporate Finance*, by B. Espen Eckbo. North-Holland: Elsevier.

Dutta, Prajit k., and Roy Radner. 1994. "Moral hazard." In *Handbook of Game Theory*, by R.J. Aumann and S. Hart, 870-903. EIsevier Science.

Dutta, Prajit K., and Roy Radner. 1994. "Moral Hazard." In *Handbook of Game Theory, Vol 2*, by Robert Aumann and Sergiu Hart, 869-903. Amsterdam: North-Holland.

E., Babbie. 2007. *The practice of social research (lith cd.).* Belmont CA: Wadsworth.

Edmonds, W. Alex, and Thomas D. Kennedy. 2017. *An Applied Guide to Research Designs; Quantitative, Qualitative, and Mixed Methods.* Los Angeles: SAGE Publications, Inc.

Fabrigar, Leandre R., and Duane T. Wegener. 2012. *Exploratory Factor Analysis: Understanding Statistics.* New York: Oxford University Press.

Falk, R. F.,, and N. B. Miller. 1992. *A primer for soft modeling.* . University of Akron Press.

Fawad, Khawaja Latif. 2022. *Structure and Format SMART-PLS Results in Data Analysis and Results Chapter.* https://researchwithfawad.com/index.php/lp-courses/basic-and-advance-data-analysis-using-smart-pls/how-to-structure-format-and-report-smart-pls-sem-results/.

Fight, Andrew. 2004. *Syndicated Lending.* Oxford: Elsevier Butterworth-Heinemann.

Finch, W. 2020. "Methods of factor extraction in exploratory factor analysis." In *Quantitative Applications in the Social Sciences*, 23-28. SAGE Publications, Inc.

Fornell, C., and D. F. Larcker. 1981. "Evaluating structural equation models with unobservable variables and measurement error." *Journal of marketing research* 18 (1): 39-50.

Gandhi, Shri R. 14 July 2015. *Securitisation in India: Ambling Down or Revving up?* Central bank speech, Deputy Governor, Reserve Bank of india, Mumbai.: National Institute of Securities Markets (NISM).

Garba, M., F. Salleh, U. A. Hafiz, Q. Y. Nasidi, and N. M. A. Bakar. 2022. "Exploratory Factor Analysis of Risk Intelligence Factors in Nigerian Small and Medium Enterprises." *International Journal of Applied Economics, Finance and Accounting* 12 (2): 52-62.

Gardner, Dr James. 2009. *Innovation and the Futureproof Bank: A practical guide to doing different business-as-usual.* United Kingdom: John Wiley & Sons Ltd.

Gaskin, J. E. 2021. *Stat Wiki.* April 09. Accessed November 22, 2021. http://statwiki.gaskination.com/index.php?title=EFA.

Gefen, D., and D. W. Straub. 2005. "A practical guide to factorial validity using PLS-Graph: tutorial and annotated example." *Communications of the AIS* 16: 91–109.

George, D., and M. Mallery. 2010. *SPSS for Windows Step by Step: A Simple Guide and Reference, 17.0 update (10a ed.)* . Boston: Pearson.

Ghasemi, A, and Zahediasl. S. 2012. "Normality tests for statistical analysis: A guide for non-statisticians. .:." *International journal of endocrinology and metabolism* 10 (2): 486.

Gitau, Robert Muiruri. 2011. "The Relationship Between Financial Innovation and Financial Performance of Commercial Banks in Kenya." *MBA Reasearch Project.* UNIVERSITY OF NAIROBI.

Gorton, Gary B., and George G. Pennacchi. 1995. "Banks and loan sales; Marketing nonmarketable assets." *Journal of Monetary Economics 35* 389-411.

Gotz, O, K Liehr-Gobbers, and M Krafft. 2010. "Evaluation of structural equation models using the Partial Least Squares (PLS) approach. ." In *Handbook of Partial Least Squares,* by VE Vinzi, WW Chin, J Henseler and H Wang, 47–82. Springer Handbooks of Computational Statistics.

Greenbaum, Stuart I. , Anjan V. Thakor, and Arnoud W. A. Boot. 2019. *Contemporary Financial Intermediation.* India: Academic Press.

Greener, Sue, and Joe Martelli. 2018. *An Introduction To Business Research Methods.*

Greenwald, Bruce C. 1986. "Adverse Selection in the Labour Market." *The Review of Economic Studies 53(3)* 325–347.

Grove, S. K., N. Burns, and J. Gray. 2013. "The practice of nursing research: Appraisal, synthesis, and generation of evidence." *Elsevier Health Sciences.*

Gundoğdu, Aysel, and Fatma Dilvin Taşkin. 2017. "Analysis Of The Relationship Between Financial Innovation And The Performance Of Turkish Banking System." *International Review of Economics and Management* 5 (3): 16-32.

Hair Jr, J. F., M. L. Gabriel, D. da Silva, and S. B. Junior. 2019. "Development and validation of attitudes measurement scales: Fundamental and practical aspects." *RAUSP Management Journal* 54 (4): 490-507.

Hair, J., W. C. Black, B. J. Babin, and R. E. Anderson. 2010. *Multivariate data analysis (7th ed.)*. Upper Saddle River, New Jersey: Pearson Educational International.

Hair, Joe F. Jr, Marko Sarstedt, Lucas Hopkins, and G. Kuppelwieser Volker. 2014. "Partial least squares structural equation modeling (PLS-SEM) An emerging tool in business research." *European Business Review* 26 (2): 106-121.

Hair, Joseph F. Jr., G. Tomas M. Hult, Christian M. Ringle, and Marko Sarstedt. 2017. *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM) Second Edition.* USA: SAGE Publications.

Hair, Joseph F., Christian M. Ringle, Marko Sarstedt, and M. Hult G. Tomas. 2011. "PLS-SEM: Indeed a Silver Bullet." *Journal of Marketing Theory and Practice* 19 (2): 139-152.

Hajer, Chenini, and Jarboui Anis. 2016. "Analysis of the Impact of Governance on Bank Performance: Case of Commercial Tunisian Banks." *Journal of the Knowledge Economy, Springer.*

Hardy, B., and L.R. Ford. 2014. "It’s not me, it’s you: Miscomprehension in surveys." *Organizational Research Methods*, 17 (2): 138–162.

Harrington, Donna. 2009. "Confi rmatory Factor Analysis." In *Pocket Guides To Social Work Research Methods*, by DSW Tony Tripodi. New York: Oxford University Press, Inc.

Hasan, M., and J. Dridi. 2010. "The Effects of the global crisis on Islamic and conventional banks: a comparative study." *IMF Working Paper, No WP/10/201.*

Haubrich, Joseph G., and Gary B. Gorton. 1988. "The Loan Sales Market." *Rodney L. White Center for Financial Research Working Papers* (Wharton School Rodney L. White Center for Financial Research) 35-88.

Heidhues, Franz, and Gertrud Schrieder . 1995. "Reaching the Poor through Financial Innovations." *Journal of International Agriculture* 132-148.

Henry, G. T. 1990. *Practical sampling.* CA: Sage Publications.

Henseler, J, CM Ringle, and RR Sinkovics. 2009. "The use of partial least squares path modeling in international marketing." *Advances in International Marketing* 20: 277–319.

Henseler, J., and M. Sarstedt. 2013. "Goodness-of-fit indices for partial least squares path modeling." *Computational Statistics* 28 (2): 565-580.

Henseler, J., T. K. Dijkstra, M. Sarstedt, C. M. Ringle, A. Diamantopoulos, D. W. Straub, and R. J. Calantone. 2014. "Common beliefs and reality about PLS: Comments on Rönkkö and Evermann (2013)." *Organizational research methods* 17 (2): 182-209.

Henseler, Jörg, Christian M. Ringle, and Marko Sarstedt. 2015. "A New Criterion For Assessing Discriminant Validity In Variance-Based Structural Equation Modeling." *Journal of the Academy of Marketing Science* 43: 115–135.

Hill, Claire A. 1996. "Securitization: A Low-Cost Sweetener for Lemons." *Washington University Law Quarterly* 74:1061–1126.

Ho, T.,, and A. Saunders. 1981. "The determinants of bank interest margins: Theory and empirical evidence." *Journal of Financial and Quantitative Analysis* 16(4), 581–600.

Hoque, A. S. M. M, Z Awang, K Jusoff, F. Salleh, and H. Muda. 2017. "Social Business Efficiency: Instrument Development and Validation Procedure using Structural Equation Modelling." *International Business Management* 11 (1): 222- 231.

Hoque, A. S. M. M., and Z. Awang. 2016. "The Exploratory Factor Analysis (EFA) of Entrepreneurial Marketing Scale - Development and Validation." *Tourism Conference.* 22.

Hoyle, R. H. 1995. *Structural equation modeling: Concepts, issues, and applications.* Sage.

Hoyle, R. K. 2011. *Structural equation modeling for social and personality psychology.*

Hu, L. T., and P. M. Bentler. 1999. "Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives." *Structural equation modeling: a multidisciplinary journal* 6 (1): 1-55.

Hu, Shu. 2014. "Study Population." *Encyclopedia of Quality of Life and Well-Being Research.*

Hulland, J. 1999. "Use of Partial Least Squares (PLS) in strategic management research: a review of four recent studies." *Strategic Management Journal* 20 (2): 195–204.

Ibrahim, Nur Irdina binti. 2018. "The Relationship between Liquidity Risk and Bank Performance in Bank : Oversea- Chinese Banking Corporation Limited, Bank in Singapore."

Independent Development Evaluation: African Development Bank. 2021. *Evaluation Of Loan Syndication At The African Development Bank Group.* Approach Paper, African Development Bank.

Irani, R. M., and R. R. Meisenzahl. 2017. "Loan sales and bank liquidity management: Evidence from a US credit register." *The Review of Financial Studies* 30 (10): 3455-3501.

Ishak, G, F. M. Leon, and B. Usman. 2021. "Did Asset Securitization Affect the Banking Financial Performance?" *European Journal of Business and Management Research* 6 (1): 6-10.

Jensen, M., and J. Meckling. 1976. "Theory of the firm: managerial behaviour, agency costs and ownership structure." *Journal of Financial Economics* 305-360.

Jobst, A. 2002. "Collateralised Loan Obligations (CLOs) – A Primer." CFS Working Paper No. 2002/13.

Kadioglu, Eyup, Niyazi Telceken, and Nurcan Ocal. 2017. "Effect of the Asset Quality on the Bank Profitability." *International Journal of Economics and Finance* 9 (7): 60-68.

Kara, Alper, Aydin Ozkan, and Yener Altunbas. 2016. "Securitisation and banking risk: what do we know so far?" *Review of Behavioral Finance Vol. 8* (Emerald Insight) 2 - 16.

Karaoglu, N. Emre. 2005. *Regulatory Capital and Earnings Management in Banks: The Case of Loan Sales and Securitizations.* Working Paper No. 2005-05 , Los Angeles, CA: FDIC Center for Financial Research.

Ketkar, Suhas , and Dilip Ratha. 2009. *Innovative financing for development.* Washington, DC: THE WORLD BANK.

Keys, B.J., T.K. Mukherjee, A. Seru, and V. Vig. 2011. "Did securitisation lead to lax screening: evidence from subprime loans 2001-2006." *Quarterly Journal of Economics* 125 (1): 307-362.

Khalid, A. C. 2012. " The Impact of Assets Quality on Profitability of Private Banks in India." *Journal of African Macroeconomics Review* .

Klein, M. 1971. "A theory of the banking firm." *Journal of Money, Credit and Banking* 3(2), 205–218.

Klein, N. 2013. "Non-performing loans in CESEE: Determinants and impact on macroeconomic performance." Working Paper No. WP/13/72.

Kline, R. B. 2011. *Convergence of structural equation modeling and multilevel modeling.*

Kline, R. B. 2015. *Principles And Practice Of Structural Equation Modeling.*

Kock, F., A. Berbekova, and A. G. Assaf. 2021. "Understanding and managing the threat of common method bias: Detection, prevention and control. ." *Tourism Management* 86.

Kock, N. 2015. "Common method bias in PLS-SEM: A full collinearity assessment approach." *International Journal of E-Collaboration* 11 (4): 1-10.

Kock, N., and G. Lynn. 2012. "Lateral Collinearity and Misleading Results in Variance-Based SEM: An Illustration and Recommendations. ." *Journal of the Association for Information Systems* 13 (7): 546–580.

Kronovet, Alan. 1997. "An Overview of Commercial Mortgage Backed Securitization: The Devil Is in the Details." *NORTH CAROLINA BANKING INSTITUTE* 1 (1): 288-321. http://scholarship.law.unc.edu/ncbi/vol1/iss1/19.

Leea, Chien Chiang , Chih Wei Wang, and Shan Ju Ho. 2020. "Financial innovation and bank growth: The role of institutional environments." *North American Journal of Economics and Finance, 53* (Elsevier Inc.) 1-23. doi:10.1016/j.najef.2020.101195.

Lenhard, Anselm. 2011. "Origination and Distribution of Debt: Risks and Regulatory Solutions., ." *European Journal of Risk Regulation, 2(3)* 340-355. doi:10.1017/S1867299X00001367.

Levy, Paul S., and Stanley Lemeshow. 2008. *Sampling of Populations: Methods and Applications.* New Jersey: A John Wiley & Sons, Inc., Publication.

Lin, Ling, Zhengwei Huang, Bestoon Othman, and Yin Luo. 2020. "Let's make it better: An updated model interpreting international student satisfaction in China based on PLS-SEM approach." *PLOS ONE* 15 (11).

Lin, Po Yu , Lee Rose, and Gurjeet Dhesi. 2009. "Originate-to-Distribute Model and UK Financial Institutions." Chap. 4 in *Proceedings of the Challenges for Analysis of the Economy, the Businesses, and Social Progress*, by Péter Kovács, Katalin Szép and Tamás Katona , 656-665. Szeged: Universitas Szeged Press.

Lotto, J. 2019. "Evaluation of factors influencing bank operating efficiency in Tanzanian banking sector." *Cogent Economics & Finance* 7 (1).

Loutskina, Elena. 2011. "The role of securitization in bank liquidity and funding management." *Journal of Financial Economics* (Elsevier B.V.) 663–684.

Lui, A. 2011. "Multiple principal-agent problems in securitisation." *Poznan University of Economic Review* 47-72.

Lund Research. 2012. *Lærd Dissertation.* Accessed 2021. https://dissertation.laerd.com/total-population-sampling.php.

Lupica, Lois R. 2001. "Securitization Transactions and the Bankruptcy Dynamic." *American Bankruptcy Institute Law Review* 9:287–322.

Lyons, Peter, and Howard J. Doueck. 2010. *The Dissertation: From Beginning to End.* Oxford: Oxford University Press, Inc.

MacCallum, RC, KF Widaman, S Zhang, and S. Hong. 1999. "Sample size in factor analysis." *Psychological Methods* 84–99.

Malmqvist, Johan, Kristina Hellberg, Gunvie Möllås, Richard Rose, and Michael Shevlin. 2019. "Conducting the Pilot Study: A Neglected Part of the Research Process? Methodological Findings Supporting the Importance of Piloting in Qualitative Research Studies." *International Journal of Qualitative Methods* (SAGE) 18.

Marques, Manuel O. , and João M. Pinto. 2020. "A comparative analysis of ex ante credit spreads: Structured finance versus straight debt finance." *Journal of Corporate Finance* (Elsevier) (62): 1-36. doi:10.1016/j.jcorpfin.2020.101580.

McShane, R.,, and I. Sharpe. 1985. "A time series/cross section analysis of the determinants of Australian trading bank loan/deposit interest margins: 1962–1981. ." *Journal of Banking and Finance,* 9(1), 115–136.

Mehari, Haben. 2020. "Strategic Fit and Potential Gains of Mergers and Acquisitions in Banking: An Emerging Market Perspective." *A Thesis submitted to College of Business and Economics of Addis Ababa University in partial fulfillment of the requirements for Master of Business Administration (MBA in Finance)* (ADDIS ABABA UNIVERSITY) 1-115.

Mekonnen, Tekalign. 2011. "Possibility of Syndicate Lending in Ethiopia Banking Industry. (Case of selected eight banks)." A Thesis submitted in Partial fulfilment of the requirements for the Degree of Master of Science in Accounting and Finance., Department of Accounting and Finance, Addis Ababa University.

Menard, S. 2001. *Applied Logistic Regression Analysis. 2nd edition.* SAGE Publications.

Menicucci, Elisa, and Guido Paolucci. 2016. "The determinants of bank profitability: empirical evidence from European banking sector." *Journal of Financial Reporting and Accounting* 14 (1): 86-115.

Mester, Loretta J. 1992. "Traditional and nontraditional banking: An information-theoretic approach." *Journal of Banking and Finance* 545-566.

Mindrila, Diana. 2017. *Exploratory Factor Analysis: Applications In School Improvement Research.* NY, New York: Nova Science Publishers, Inc.

Mishkin, Frederic S. 1990. "Asymmetric information and financial crises: a historical perspective." *Financial Crisis.* Florida: National bureau of economic research. Working Paper No. 3400.

Mishkin, Frederic S. 1991. "Anatomy of a Financial Crisis." *National Bureau of Economic Research Working Papers Series* 1-28.

Mishkin, Frederick S., Kent Matthews, and Massimo Giuliodori. 2013. *The Economics of Money, Banking And Financial Markets.* European: Pearson Education Limited.

Mishra, P. K. 2008. "Financial Innovation and Economic Growth-A Theoretical Approach." http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1262658.

Mishra, Prabhaker, Chandra M Pandey, Uttam Singh, Anshul Gupta, Chinmoy Sahu, and Amit Keshri. 2019. "Descriptive Statistics and Normality Tests for Statistical Data." *Ann Card Anaesth* 22: 67-72.

Mohamed, Bakousha, Mishraa Tapas, and Wolfea Simon. 2018. "Securitization, Monetary Policy and Bank Stability." *Available at SSRN 3630704.*

Mohd, Effendi, Firdaus Mohd Noh Muhamad, Afandi Zainal Mohammed, and Rina Mohd Matore Effa. 2020. "Establishing factorial validity in Raven advanced progressive matrices (RAPM) in measuring IQ from polytechnic students' ability using exploratory factor analysis (EFA)." *Proceedings of Mechanical Engineering Research Day* 248-250.

Mokatsanyane, Daniel, Paul-Francois Muzindutsi, and Diana Viljoen. 2017. "Credit Risk and Securitisation in the South African Banking Sector." *Acta Universitatis Danubius* 13 (2): 102-121.

Monti, M. 1972. "Deposit, credit and interest rate determination under alternative bank objective functions." In *Mathematical methods in investment and finance*, by K. Shell and G.P. Szego (Eds), pp. 431–454. Amsterdam: North-Holland.

Morcos, Fadi, and Daniel Zalecki. 2006. *Securitization As An Alternative Tool Of Financing Student Loans - A Case Study For CSN.* Master Thesis, Lund University, School of Economics and Management, Department of Business Administration.

Mowbray, Fabrice I., Susan M. Fox-Wasylyshyn, and Maher M. El-Masr. 2019. "Univariate Outliers: A Conceptual Overview for the Nurse Researcher." *Canadian Journal of Nursing Research* (SAGE Publications) 51 (1): 31-37.

Mulaik, S. A. 2009. *Foundations of factor analysis.* New York: Chapman & Hall/CRC.

Mustapha, S.A. 2018. "E-Payment technology effect on bank performance in emerging economies-evidence from Nigeria." *Journal of Open Innovation: Technology, Market, and Complexity* 4 (4): 43.

Nagle, R. 1991. "Bank consolidation in to the twenty first century." Bankers magazine.

National Bank of Ethiopia. 2021. *National Bank of Ethiopia.* Accessed 11 09, 2021. https://nbebank.com/banks/.

Nawazish, Mirza, Rahat Birjees, and Reddy Krishna. 2015. "Business dynamics, efficiency, asset quality and stability: The case of financial intermediaries in Pakistan." *Economic Modelling* 46: 358-363.

NBE. 2019/2020. *Annual Report.* Annual Report, Addis Ababa: National Bank of Ethiopia.

Neuman, W. Lawrence. 2014. *Social Research Methods: Qualitative and Quantitative Approaches.* USA: Pearson Education Limited.

New Business Ethiopia. 2020. *Ethiopia approves law to introduce capital market* . December 22. https://newbusinessethiopia.com/trade/ethiopia-approves-law-to-introduce-capital-market.

Nyoni, Thabani. 2018. "Information asymmetry in the banking sector: a zimbabwean scenario." *International Journal of Marketing & Financial Management* 45-51.

O'leary, Zina. 2004. *The essential guide to doing research.* London: SAGE Publications Ltd.

Office of the Comptroller of the Currency. 1997. "Asset Securitization." Comptroller's Handbook November.

Oliver Wyman. 2012. *Rethinking Financial Innovation, Reducing Negative Outcomes While Retaining The Benefits.* Geneva: World Economic Forum.

Orcan, F. 2020. "Parametric or non-parametric: Skewness to test normality for mean comparison." *International Journal of Assessment Tools in Education* 7 (2): 255-265.

Pallant, J. 2020. *SPSS survival manual: A step by step guide to data analysis using IBM SPSS.* Routledge.

Pavel , Christine , and David Phillis. 1987. "Why commercial banks sell loans: An empirical analysis." *Economic Perspectives* (Federal Reserve Bank of Chicago) vol. 11 (May, 3-14): 3-14.

Pennacchi, George G. 1988. "Loan Sales and the Cost of Bank Capital." *The Journal of Finance* Vol. 43 (2): 375-396.

Podsakoff, P. M., S. B. MacKenzie, and N. P. Podsakoff. 2012. "Sources of method bias in social science research and recommendations on how to control it." *Annual Review of Psychology* 63 (1): 539–569.

Polit, D. F. 2010. *Statistics and data analysis for nursing research (2nd ed.).* Boston, MA: Pearson.

Pradhan, Prof. Dr. Radhe S., and Amrit Kumar Shrestha. 2017. "The impact of capital adequacy and bank operating efficiency on financial performance of Nepalese commercial banks."

Purnanandam, Amiyatosh. 2010. *Originate-to-Distribute Model and the Subprime Mortgage Crisis.* Working Paper No. 2010-08, Federal Dposit Insurance Corporation • Center for Financial Research.

Rietveld, T., and R. van Hout. 2015. "The t test and beyond: Recommendations for testing the central tendencies of two independent samples in research on speech, language and hearing pathology." *Journal of communication disorders* 58: 158-168.

Rohana, Ngaha, T. Ramayah, and Sarmidy Rahimah. 2018. "Partial Least Square Analysis On Micro Enterprises' Intellectual Capital And Performance: The Mediating Effect Of Tacit Knowledge Sharing." *Journal of Applied Structural Equation Modeling* 2 (2): 22-33.

Rosenthal, James A., and Juan M. Ocampo. 1988. *Securitization of Credit: Inside the New Technology of Finance.* New York: John Wiley & Sons.

Santibanez, Nicolas Hernandez, Dylan Possamai, and Chao Zhou. 2019. "Bank Monitoring Incentives Under Moral Hazard and Adverse Selection." *Journal of Optimization Theory and Applications.*

Sarstedt, M., J. F. Hair Jr, J. H. Cheah, J. M. Becker, and C. M. Ringle. 2019. "How to specify, estimate, and validate higher-order constructs in PLS-SEM." *Australasian Marketing Journal (AMJ)* 27 (3): 197-211.

Sarstedt, Marko, and Erik Mooi. 2019. *A Concise Guide to Market Research: The Process, Data, and Methods Using IBM SPSS Statistics.* Berlin: Springer.

Saunders, Mark N. K., Philip Lewis, and Adrain Thornhill. 2019. *Research methods for business students.* United Kingdom: Pearson Education Limited.

Sekaran, Uma, and Roger Bougie. 2016. *Research Methods for Business: A Skill-Building Approach.* UK: John Wiley & Sons.

Simons, Katerina. 1993. "Why do banks syndicate loans?" *New England Economic Review, Federal Reserve Bank of Boston* 45-52.

Somekh, Bridget, and Cathy Lewin. 2005. *Research Methods In The social Sciences.* SAGE Publications.

Spearman, C. 1904. "'General intelligence,' objectively determined and measured." *The American Journal of Psychology* 15 (2): 201–293.

Stein, J. 1998. "An Adverse-Selection Model of Bank Asset and Liability Management with Implications for the Transmission of Monetary Policy. RAND ." *The RAND Journal of Economics* 466- 86.

Steven Drucker, Manju Puri. 2007. "On Loan Sales, Loan Contracting, and Lending Relationships." *FDIC Center for Financial Research Working Paper.*

Stuart, I. Greenbaum, and Anjan V. Thakor. 1987. "Bank Funding Modes: Securitization Versus Deposits." *Journal of Banking and Finance* 11: 379-401.

Sufian, Fadzlan, and Mohamad Akbar Noor Mohamad Noor. 2012. "Determinants of Bank Performance in a Developing Economy: Does Bank Origins Matters?" *Global Business Review* 13(1) 1–23.

Tabachnick, B. G., and L. S. Fidell. 2013. *Using multivariate statistics (6th ed.).* Boston, MA: Pearson.

Teo, T. S. H., S. C. Srivastava, and L. Jiang. 2008. "Trust and electronic government success: an empirical study ." *Journal of Management Information Systems* 25 (3): 99–132.

Thompson, B. 2000. "Ten commandments of structural equation modeling." In *\Reading and understanding more multivariate statistics*, by L. Grimm and P. Yarnold, 261-284. Washington, DC: American Psychological Association.

Thompson, Bruce. 2004. *Exploratory And Confirmatory Factor Analysis: Understanding Concepts And Applications.* Washington, DC: American Psychological Association.

Tinsley, H. E.,, and D. J. Tinsley. 1987. "Uses of factor analysis in counseling psychology research. ." *Journal of counseling psychology* 34 (4): 414.

Tirole, J. 1993. *The Theory of Industrial Organization.* Cambridge, MA: MIT Press.

Trester, Jeffrey J., and Anthony M. Santomero. 1998. "Financial innovation and bank risk taking." *Journal of Economic Behavior & Organization* Vol. 35: 25–37.

Trochim, William M., James P. Donnelly, and Kanika Arora. 2016. *Research Methods: The essential knowledge base.* Boston: Cengage Learning.

Tucker, Ledyard R, and Robert C. MacCallum. 1997. *Exploratory Factor Analysis.*

Ugo, Albertazzi, Margherita Bottero, Leonardo Gambacorta, and Steven Ongena. 2017. *Asymmetric information and the securitization of SME loans.* BIS Working Paper, Monetary and Economic Department of the Bank for International Settlements.

Velliscig, Giulio, Josanco Floreani, and Maurizio Polato1. 2022. "Capital and asset quality implications for bank resilience and performance in the light of NPLs' regulation: a focus on the Texas ratio." *Journal of Banking Regulation.*

Vieira, Helena. 2017. *The London School of Economics and Political Science.* 04 21. Accessed 02 01, 2022. https://blogs.lse.ac.uk/businessreview/2017/04/21/the-dodd-frank-act-doesnt-solve-the-principal-agent-problem-in-asset-securitisation/#:~:text=As%20we%20have%20identified%2C%20in,the%20quality%20of%20the%20borrower.

Vittinghoff, E, DV Glidden, SC Shiboski, and CE McCulloch. 2012. *Regression Methods in Biostatistics: Linear, Logistic, Survival, and Repeated Measures Models. 2nd ed.* Springer.

Waemustafa, W.,, and S. Sukri. 2016. "Systematic and unsystematic risk determinants of liquidity risk between Islamic and conventional banks."

Wambui, Charles Mbugua. 2014. "Feasibility Study Of Asset-Backed Securities In Kenya (A Case of Nairobi Securities Exchange)." A Project Report Submitted in Partial Fulfillment of the Requirement for the Degree of Masters in Business Administration (MBA), Business Administration (MBA), United States International University.

Watkins, Marley W. 2021. *A Step-By-Step Guide To Exploratory Factor Analysis With R And Rstudio.* New York, NY: Routledge.

Whalen, G. 1991. "A proportional hazards model of bank failure: An examination of its usefulness as an early warning tool." *Economic Review* (Federal Reserve Bank of Cleveland) 27 (1).

White, Lawrence J., and W. Scott Frame. 2009. "TECHNOLOGICAL CHANGE, FINANCIAL INNOVATION, AND FINANCIAL REGULATION IN THE U.S.: THE CHALLENGES FOR PUBLIC POLICY." In *The Oxford Handbook of Banking*, by A N. Berger, P. Molyneux and J.O.S Wilson eds., Chapter 19. forthcoming: Oxford University Press.

Wolf, E. J.,, K. M., Harrington, S. L., Clark, and M. W. Miller. 2013. "Sample size requirements for structural equation models: An evaluation of power, bias, and solution propriety. ." *Educational and psychological measurement* 73 (6): 913-934.

World Trade Organization. 2020. *Ethiopia resumes WTO accession negotiations after an eightyear pause.* January 31. https://www.wto.org/english/news_e/news20_e/acc_eth_31jan20_e.htm.

Yamane, Taro. 1967. *Statistics, An Introductory Analysis, 2nd Ed.* New York: Harper and Row.

Yin, N. P. 1999. "Look at Taiwan’s Banking Problems from Asian Finance Crisis." Banking Finance Magazine.

Yuanita, N. 2019. "Competition and bank proftability." *Journal of Economic Structures* 8 (31).

Zeh, David W., Jeanne A. Zeh, and Eldredge Bermingham. 1997. "Polyandrous, Sperm-Storing Females: Carriers of Male Genotypes Through Episodes of Adverse Selection'." *Biological Sciences* 264(1378): 119–125.

Zikmund, William G., Barry J. Babin, and Mitch Griffin Jon C. Carr. 2009. *Business Research Methods*. Ohio: South Western Cengage Learning.

Zouari, Ghazi, and Imen Abdelmalek. 2020. "Financial Innovation, Risk Management, and Bank Performance." *Copernican Journal of Finance & Accounting* 9 (1): 77-100.

APPENDICES

APPENDICES

<u>Appendix A Questionnaire</u>

Questionnaire

Addis Ababa Univeristy

School Of Graduate Studies

Msc In International Business Program

Dear Sir/Madam

My name is Yishak Hailu, I am a fiinal year student for the Masters program of International Business Management (Msc) at Addis Ababa University, Faculty of Business and Economics, Department of Management.

I am conducting a study titled “The Mediating Effect of Information Asymmetry on the Relationship Between Financial Innovation and OTD Bank Performance.”

Greatly appreciate for your willingness to volunteer and for taking the time to complete this questionnaire. This questionnaire is being carried out in order to obtain your valued insight for educational purposes. Please take a couple of minutes to complete this questionnaire. Your sincere response is critical to the study's success and, ultimately, to significant results. I respectfully request that you complete this questionnaire and give me back as soon as possible. Your responses will be kept completely confidential.

Kind regards,

Yishak Hailu, Msc Student

Addis Ababa University

The Mediating Effect of Information Asymmetry on the Relationship Between Financial Innovation and OTD Bank Performance.

Part One: Personal Information

1. **Name**: ____ (Optional)

   Put tick mark "√" for each question as required.

2. **Sex** ☐ (1) Female ☐ (2) Male
3. **Age** ☐ (1) 18-30 ☐ (2) 31-45 ☐ (3) 45-55 ☐ (4) 55 and above
4. **Education**: ☐ (1) Diploma ☐ (2) Degree ☐ (3)Master ☐ PhD and above
5. **Year of service in Banking Industry**

   (1) 0-2 ☐ (2)3-5 ☐ (3) 6-10 ☐ (4)11-15 ☐ (5)16-20 ☐ (6) 21 years and above ☐
6. **Department**
   1. Research and Development ☐
   2. Credit operation ☐
   3. Retail Banking ☐
   4. Finance ☐
   5. International Business ☐
7. **Job Position**
   1. Chief officer ☐
   2. Director ☐
   3. Senior manager ☐
   4. Managers ☐
   5. Senior officers ☐
8. **Bank Name**
   1. CBE ☐
   2. AIB ☐
   3. DB ☐
   4. BOA ☐
   5. LIB ☐
   6. WB ☐
   7. NIB ☐
   8. ZB ☐
   9. ADIB ☐
   10. DGB ☐

Part II: Research Questions

The Mediating Effect of Information Asymmetry on the Relationship Between Financial Innovation and OTD Bank Performance.

The following are types of financial innovations (Loan Sale, Loan Syndication and Securitization) that are present in the Originate-to-Distribute model of a bank.

To which extent do you agree or disagree with the following five-point scale statement?

(1= strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree

No.	**Loan Sale**	**1**	**2**	**3**	**4**	**5**
1.	Loan sale allows the sold loan to be removed in partial or in full from the balance sheet of the bank					
2.	Banks by selling the loan they originated can transfer the credit risk.					
3.	Loan sale benefits borrowers in getting continuous loans.					
4.	Banks by selling loans can enhance their liquidity.					
5.	Banks by selling their loan can diversify their portfolio holding by originating other types of loans.					
6.	loan sales can provide lower cost financing for bank					

No.	**Loan Syndication**	**1**	**2**	**3**	**4**	**5**
1.	Loan syndication enables bank to originate loans as one to a particular borrower.					
2.	Loan syndication helps banks avoid excessive exposure to a single borrower.					
3.	Banks by participating in a syndicate loan can attract quality businesses in which they don’t have a relationship with.					
4.	Loan size drive banks to syndicate a loan.					
5.	Loan syndication can be used as a strategy to enhance fee income.					

The Mediating Effect of Information Asymmetry on the Relationship Between Financial Innovation and OTD Bank Performance.

No.	**Securitization**	**1**	**2**	**3**	**4**	**5**
1.	Securitization enables banks to transform illiquid financial claims in to tradeable ones.					
2.	Securitization encourages additional lending capacity to the real economy					
3.	Securitization can provide additional investment opportunities to institutional investors.					
4.	Securitization decreases funding risk for banks by diversifying funding sources					
5.	By restructuring Non performing loans securitization can transfer credit risk exposure to wider capital market.					

The following are types of Information Asymmetry (Moral Hazard and Adverse Selection) that are investigated for research purpose. Please rate to which extent you agree or disagree with the following five-point scale statement?

Rating scale ***(1= strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree)***

No.	**Moral Hazard**	**1**	**2**	**3**	**4**	**5**
1.	Monitoring borrower is one of the main activities of a bank.					
2.	In the Originate-to-Distribute model managers have week incentive to assess credit risk accurately.					
3.	In the Originate-to-Distribute model managers have week incentive to monitor a loan.					
4.	The OTD banking model motivates managers to put first their own interests rather than company's value.					
5.	Moral hazard problem hinders bank's ability to perform positively.					

No.	**Adverse Selection**	**1**	**2**	**3**	**4**	**5**
1.	Loan screening is at the main activities of a bank.					
2.	In the Originate-to-Distribute model managers have week incentive to Screen a loan.					
3.	The OTD model motivates lenders to sell low quality loans.					

		1	2	3	4	5
4.	Adverse selection problem hinders bank's ability to perform positively.					

The following are measurement indicators of Bank Performance (Asset Quality, Liquidity, Capital Adequacy and Profitability) that are investigated for research purpose. Please rate to which extent you agree or disagree with the following five-point scale statement?

Rating scale ***(1= strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree)***

No.	**Asset Quality**	**1**	**2**	**3**	**4**	**5**
1.	Lower asset quality reduces bank performance.					
2.	Moral Hazard problem in the OTD banking model reduces Asset Quality.					
3.	Adverse Selection problem in the OTD banking model reduces Asset Quality.					
4.	Loan portfolio distribution contributes to a higher asset quality.					
5.	Financial Innovation leads to a better Asset quality.					

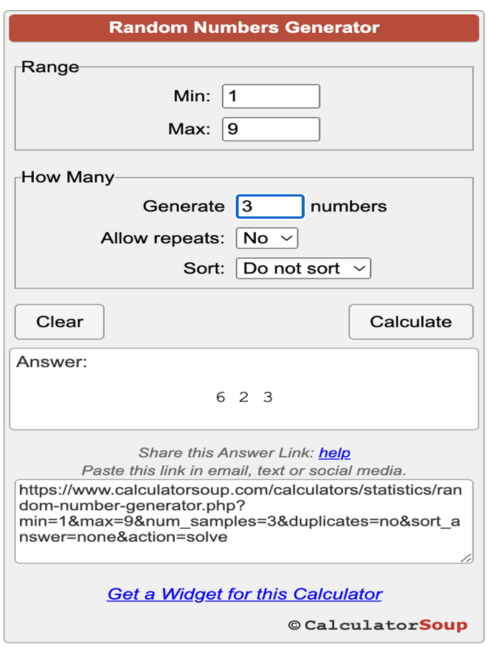
No.	**Liquidity**	**1**	**2**	**3**	**4**	**5**
1.	Liquidity determines the performance of banks.					
2.	Liquidity motivates a bank to sell part of their loans to third parties.					
3.	liquidity can be increased by transferring the illiquid loans into marketable ones.					
4.	Moral Hazard problem in the OTD banking model will result in a liquidity shock in the market.					
5.	Adverse Selection problem in the OTD banking model will result in a liquidity shock in the market.					
6.	Financial innovation increases liquidity in the market.					

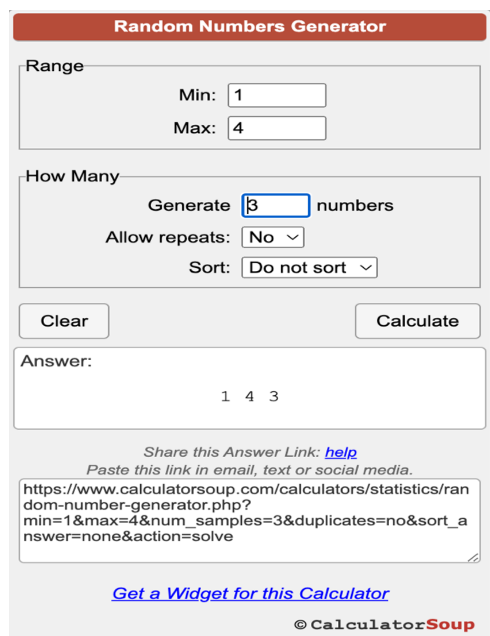
No.	**Capital Adequacy**	**1**	**2**	**3**	**4**	**5**
1.	Capital Adequacy ensures the stability of bank performance.					

2.	By transferring debts to become off-balance sheet item, banks can satisfy their capital adequacy requirement.					
3.	Regulatory capital requirement motivates banks to distribute their loan portfolio through OTD bank model.					
4.	Information asymmetry leads to a bank capital adequacy problem.					

No.	**Profitability**	**1**	**2**	**3**	**4**	**5**
1.	Profitability measures the performance of a bank.					
2.	By originating and servicing loans through the OTD Model banks have additional income stream that increases profitability.					
3.	Moral Hazard problem affect profitability of a bank.					
4.	Adverse Selection problem affects profitability of a bank.					
5.	Financial innovation enhances banks profitability level.					

Appendix B Random Sample Generator





Appendix C Normality Test: Results for Skewness and Kurtosis (SPSS 26 Output).

		Skewness		Kurtosis	
	N	Statistic	Std. Error	Statistic	Std. Error
LSA1	267	0.096	0.149	-0.902	0.297
LSA2	267	0.146	0.149	-0.871	0.297
LSA3	267	0.226	0.149	-0.916	0.297
LSA4	267	-0.024	0.149	-1.005	0.297
LSA5	267	0.011	0.149	-1.006	0.297
LSA6	267	-0.03	0.149	-0.999	0.297
LSY1	267	-0.242	0.149	-0.972	0.297
LSY2	267	-0.227	0.149	-0.827	0.297
LSY3	267	-0.348	0.149	-0.615	0.297
LSY4	267	-0.019	0.149	-0.896	0.297
LSY5	267	-0.093	0.149	-1.036	0.297
SEC1	267	0.034	0.149	-0.755	0.297
SEC2	267	-0.078	0.149	-0.635	0.297
SEC3	267	0.024	0.149	-0.625	0.297
SEC4	267	-0.176	0.149	-0.421	0.297
SEC5	267	-0.174	0.149	-0.679	0.297
MH1	267	-0.653	0.149	0.891	0.297
MH2	267	-0.614	0.149	0.534	0.297
MH3	267	-0.863	0.149	1.539	0.297
MH4	267	-0.531	0.149	-0.415	0.297
MH5	267	-0.898	0.149	1.713	0.297
AS1	267	-0.266	0.149	-0.797	0.297
AS2	267	-0.172	0.149	-0.909	0.297
AS3	267	-0.449	0.149	-0.502	0.297
AS4	267	-0.212	0.149	-0.774	0.297
AQ1	267	-0.801	0.149	1.608	0.297
AQ2	267	-0.892	0.149	1.251	0.297
AQ3	267	-0.776	0.149	1.332	0.297
AQ4	267	-0.717	0.149	1.854	0.297
AQ5	267	-0.827	0.149	1.968	0.297
LQ1	267	-1.019	0.149	1.237	0.297
LQ2	267	-0.851	0.149	2.131	0.297
LQ3	267	-0.989	0.149	1.187	0.297
LQ4	267	-1.423	0.149	1.529	0.297

LQ5	267	-0.628	0.149	1.4	0.297
LQ6	267	-0.128	0.149	-1.314	0.297
CA1	267	-0.883	0.149	2.274	0.297
CA2	267	-0.87	0.149	1.728	0.297
CA3	267	-0.857	0.149	1.894	0.297
CA4	267	-0.524	0.149	0.14	0.297
PROF1	267	-0.694	0.149	1.699	0.297
PROF2	267	-0.549	0.149	1.45	0.297
PROF3	267	-0.523	0.149	0.748	0.297
PROF4	267	-0.734	0.149	1.986	0.297
PROF5	267	-0.569	0.149	1.297	0.297

Appendix D Communalities output (SPSS 26 Output).

Communalities

	Initial	Extraction
LSA1	1.000	.635
LSA2	1.000	.790
LSA3	1.000	.831
LSA4	1.000	.827
LSA5	1.000	.848
LSA6	1.000	.799
LSY1	1.000	.747
LSY2	1.000	.777
LSY3	1.000	.740
LSY4	1.000	.733
LSY5	1.000	.740
SEC1	1.000	.677
SEC2	1.000	.611
SEC3	1.000	.636
SEC4	1.000	.589
SEC5	1.000	.674
MH1	1.000	.721
MH2	1.000	.748
MH3	1.000	.778
MH4	1.000	.790

MH5	1.000	.775
AS1	1.000	.793
AS2	1.000	.755
AS3	1.000	.724
AS4	1.000	.676
AQ1	1.000	.700
AQ2	1.000	.654
AQ3	1.000	.796
AQ4	1.000	.761
AQ5	1.000	.788
LQ1	1.000	.683
LQ2	1.000	.707
LQ3	1.000	.708
LQ4	1.000	.626
LQ5	1.000	.568
LQ6	1.000	.651
CA1	1.000	.721
CA2	1.000	.671
CA3	1.000	.662
CA4	1.000	.547
PROF1	1.000	.646
PROF2	1.000	.647
PROF3	1.000	.632
PROF4	1.000	.747
PROF5	1.000	.670
Extraction Method: Principal Component Analysis.		

Appendix E Scree Test Criterion (SPSS 26 Output).