Determinants of Insurance Penetration in Africa

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DECLARATION

I declare that this work has not been previously submitted and approved for the award of a degree by this or any other University. To the best of my knowledge and belief, the Research Project contains no material previously published or written by another person except where due reference is made in the Research Project itself.

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This Research Project has been submitted for examination with my approval as the Supervisor.

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Abstract

This study examines key determinants impacting insurance penetration in Africa, where it remains low despite its importance in economic stability. The study uses a panel Auto-Regressive Distributed Lag (ARDL) model with quarterly data from 2008 to 2022 from eight different African nations to assess the effects of GDP, income levels, inflation, and demographic dynamics over different time horizons.

The results show cyclical patterns in the relationship between insurance premiums and penetration, with positive impacts in the short run, negative in the near term, and favorable in the long run. Inflation continuously reduces insurance uptake, whereas young-age dependence increases penetration in the near term but decreases it in the long run. In contrast, old-age dependence has a negative influence that becomes positive over time. GDP and income levels have a favorable short-term impact on insurance penetration, but they reduce or turn negative in the long run owing to market saturation and alternative risk-management measures.

It emphasizes the complex interaction of economic, demographic, and behavioral dynamics, as well as the significance of adaptive methods for long-term growth. Limitations include cultural and statistical heterogeneity, and future studies should include single-country analysis, the inclusion of under-represented nations, and the investigation of technical and cultural effects to better understand insurance dynamics in Africa.

List of abbreviations

GDP -Gross Domestic Product

ARDL-Auto Regressive Distributed Lag

AIC - Akaike information criterion

BIC-Bayesian Information Criterion

CHAPTER ONE

1.0 Introduction

1.1 Background

Insurance is more than simply a contract; it provides a safety net through the policy. This agreement guarantees that the policyholder will get financial protection or compensation from an insurance provider in the case of specific losses. Insurance contracts assist in reducing and dispersing risk. Typically, these contracts require the insured to make a predetermined payment in exchange for a promise of payment under specified situations, such as a death in life insurance. Insurance firms play a vital role in pooling their clients' risks and keeping insurance costs affordable.

According to the Insurance Institute of South Africa (IISA), there are two main types of insurance: life insurance and non-life insurance. Long-term insurance (life insurance) covers individuals. It involves long-term commitments such as whole life insurance, term assurance, pensions, annuities, critical illness cover, health insurance, and disability cover. Conversely, short-term insurance covers property such as buildings, and related liability insurance. It is usually arranged annually and can be renewed for twelve months (IISA, 2022).

Insurance helps economic growth by boosting savings, decreasing unnecessary precautionary savings, and transforming idle money into productive capital through risk reduction in all sectors of the economy (Liedtke, 2007). Insurance not only allows people to save money, but it also gives financial security. Personal and social insurance benefits are essential for keeping employees healthy and financially stable when changing professions. Government intervention in the insurance business, whether through direct coverage or partnership with the industry, can stimulate economic growth. (Ul Din et al., 2017)

Even for those with limited discretionary cash, insurance can serve as a vital instrument for managing risks and helping them manage the stress of illness, natural catastrophe, or financial strain arising from the death of the head of the family (Klapper and Demirguc – Kunt, 2017). The World Bank (2011) estimates that 1.2 billion people worldwide live under extreme poverty and that another 1.8 billion are under moderate

poverty. Only one to three percent of these people have access to insurance products yet they continue to be exposed to various risks including sickness, livestock losses, and catastrophic weather (Tucker, 2007).

The insurance industry's capacity to shield individuals and organizations against financial risks provides an additional incentive for people to invest, thus creating more capital. This, in turn, improves economic performance and eventually adds to a rise in GDP. As a result, the insurance industry is critical to encouraging a country's economic prosperity (Masci et al., 2007)

The present global insurance penetration rate is exceptionally low, with countries, such as Uganda, having rates as low as 0.88%, and others, such as South Africa, having a total penetration of 16.99% as of 2017, accounting for about 70% of Africa's total insurance penetration rate. The disparities in rates between African countries highlight the complexities of the issues involved.

Efforts to promote insurance product knowledge and awareness in Africa have contributed to higher insurance penetration. However, (Signé, 2020) argues that Africa's aggregate insurance penetration of 2.78% in 2019 is much lower than the worldwide average of 7.23%. Currently, insurance penetration is extremely low in Africa. Excluding South Africa, where total premiums are about 1% of the Gross Domestic Product, but significantly lower than the 5% in Asia and 9% in Europe (SCR/AIO, 2022). Thus, there is a need to look more into Africa's insurance penetration, focusing on the variables that may be contributing to these low penetration rates in various African countries. This study aims to determine the factors contributing to Africa's insurance penetration rates.

1.2 Insurance Penetration in Africa

As (Kajwang, 2020), points out, that risk transfer systems allow people, organizations, and governments to minimize their exposure to losses, legal lawsuits, or natural calamities that might otherwise be disastrous if uninsured. The extent to which a country's markets participate in insurance demonstrates acceptance of insurance as both a risk mitigation method and an investment source. A low percentage of the population covered by insurance suggests slow growth. (Tesfaye, 2018). Consequently, this paper aims to identify the factors contributing to the low penetration of insurance in Africa.

Lucia (2015) defines insurance penetration as a measure of insurance's contribution to the Gross Domestic Product (GDP).

It serves to analyze the growth of the insurance industry within a nation and is computed as the ratio of total insurance premiums to the GDP in a certain year. (*Insurance Penetration Rate by Country 2022*, n.d.). A high insurance penetration rate indicates that the insurance sector makes a significant contribution to a country's economy. As a result, economic growth is promoted by promoting savings, lowering unneeded precautionary savings, and offering risk mitigation in various sectors of the economy. (Emamgholipour et al., 2017).

According to(Demirguc-Kunt et al., 2017), insurance penetration is a financial inclusion metric that measures how often people and organizations utilize insurance products. It gives a dependable method for comparing insurance across nations and areas. However, in as much as the penetration rate provides an overall picture of how an insurance market is doing, it does not provide particular information on local insurance market dynamics. Due to data limitations, the study was unable to investigate non-insurance risk mitigation approaches that may not be represented in the insurance penetration rate.

Instead of concentrating solely on nations with high insurance penetration, this study will look at different African countries to better understand the variables impacting insurance penetration throughout the continent while considering the various market dynamics.

Africa is an attractive and promising market, with a population of 1.40 billion, the world's second largest. However, insurance penetration is less than 3%, with 650 million mobile users (EY Report, 2021).

Africa's insurance market provides a unique terrain with multiple potential and difficulties. According to Akotey, Osei, and Gemegah (2011), it is important to promote economic stability by providing people or corporations with financial protection or compensation for losses through insurance firms.

Despite its growth, Africa's insurance sector is considered to be in its early phases (Mapfumo, 2016). Although demand for insurance is expanding in tandem with African economic growth, insurance penetration rates remain relatively low in comparison to other areas, as the majority of Africans struggle to satisfy basic requirements such as food (KPMG, 2019). Many Africans rely on their communities and neighbors for insurance, which presents issues for the emerging countries' insurance business. Additionally, there is a paucity of official insurance providers in Africa. In 2012, just 3.56% of the population was insured, with Africa ranked fifth among regions behind Advanced Asia, North America, Western Europe, and Oceania. South Africa had the greatest insurance penetration in Africa in 2020, at 16.99%, whereas other countries such as Nigeria had 0.23%, and Ethiopia at 0.55% to mention but a few.

Africa's insurance industry is highly fragmented, with variable distribution between nations. For example, 91% of insurance premiums are concentrated in only ten nations, with South Africa accounting for 70% (McKinsey & Company, 2017).

The differences in insurance penetration rates among African countries highlight the multiple factors at work. Several elements help to understand this occurrence. KPMG's (2019) assessment of the state of insurance in Africa identified many issues contributing to the continent's low insurance penetration, including mistrust of financial service providers and international insurance corporations' unwillingness to expand in Africa. According to Kange', the factors leading to poor insurance penetration in Africa are unfavorable attitudes, cultural and religious beliefs, insufficient products, restricted distribution channels, and a lack of public awareness of insurance products and benefits.

Other significant factors impacting insurance penetration, such as inflation rate, exchange rate, insurance premium, and economic growth, have been acknowledged by several researchers (Jahromi & Goudarzi, 2014; Alhassan & Biekpe, 2016; Das &

Shome, 2016, etc.). However, existing studies exhibit notable deficiencies warranting further inquiry.

Empirical research findings present inconsistencies in the relationship between these variables and insurance penetration. For instance, (Jahromi & Goudarzi, 2014) assert that inflation has a positive effect on insurance penetration. Conversely, high inflation rates may reduce the real value of savings, discouraging prospects from purchasing insurance products (Ramlall, 2009).

Adeola and Ogbeide (2019) discovered that exchange rate volatility has a significant beneficial influence on insurance penetration in Africa, implying that the relationship between exchange rates and insurance penetration is not well understood. They argue that exchange rate changes increase uncertainty and risk, leading to a larger demand for insurance. However,(Akinlo & Apanisile, 2014) propose a negative relationship, suggesting that insurance penetration tends to decline when exchange rates are unstable.

The disparities in insurance penetration rates between African countries highlight the complexities of the issues at hand. To understand this phenomenon, it is critical to understand the various determinants of insurance penetration and why certain factors may affect insurance uptake differently in African nations than in other areas. By analyzing these distinct relationships, one may acquire a better understanding of the distinctive economic aspects that influence insurance penetration in Africa. For example, I believe that moderate inflation in more developed economies such as South Africa may enhance consumer spending and investment, resulting in higher insurance penetration. However, in Uganda, a low-income nation as advised by the World Bank, low-income people might not contemplate insurance amid inflation as they are already struggling to meet their basic needs.

To gain complete knowledge of the factors impacting insurance penetration rates in Africa, the study will involve a mix of countries. Specifically, at least one country from each African region (north, east, west, south, central) will be chosen to represent the various GDP categories (high, moderate, and low). This method will allow for a fair comparison across different economic settings and locations. By examining a variety of countries with varying income levels, income distribution, inflation rates, and other relevant factors, this study aims to identify the determinants of insurance penetration identified by previous research, ensuring a broad representation and aiding in the

discovery of patterns, relationships and significance between the selected variables and insurance penetration rates across the continent.

1.3 Problem Statement

Insurance penetration levels in a country reflect the market's readiness to use insurance as a risk management technique and source of investment. Previous research implies that insurance stimulates economic growth by raising savings, transforming idle money into productive capital, and maintaining financial stability. Despite these benefits, Africa's insurance penetration remains low. Barriers to increased penetration include inflation, income levels, mistrust of financial service providers, cultural and religious beliefs, insufficient goods, restricted distribution channels, and a lack of public knowledge of insurance advantages. Empirical data also reveal anomalies in the association between factors such as inflation, income levels financial development and literacy, exchange rates, and insurance uptake, indicating the need for more research.

Insurance penetration in African countries is incredibly low. Countries such as Nigeria have low rates of 0.23%, whilst South Africa has achieved a rate of 16.99% as evaluated by gross premiums as a percentage of GDP. This substantial gap in insurance coverage, particularly when compared to other continents, highlights the need to investigate what variables contribute to Africa's insurance penetration and how we can improve these rates.

Furthermore, the reliance on informal risk-coping methods, as well as the fact that a substantial proportion of the population lacks any type of risk protection, highlight the critical need for focused study. By including a diverse selection of countries from different regions of Africa with varying GDP levels (high, moderate, and low), the research aims to achieve a balanced comparison and uncover unique and common determinants of insurance penetration, facilitating a comprehensive understanding of how specific factors interact with insurance uptake in different contexts, providing insights crucial for developing targeted strategies to improve insurance coverage and promote financial resilience across the continent.

1.4 Research Objectives

1.4.1 General Research Objective

To investigate the key factors influencing insurance penetration in Africa and provide insights on enhancing insurance market development across the continent.

1.4.2 Specific Objectives

1. To analyze the relationship between the different determinants and insurance penetration in Africa.
2. To explore the effect of income levels and inflation rate on insurance penetration in African economies.
3. To assess the significance of the different factors that affect insurance penetration in Africa.

1.5 Research Questions

1. What is the relationship between identified factors and insurance penetration in Africa?

2. Do these factors significantly influence insurance penetration in African countries?

3. How does inflation impact the insurance market in African countries in the long run?

1.6 Significance of the Study

The variation in insurance penetration rates among African countries highlights the complexities of the factors that impact insurance consumption. Despite the widely acknowledged necessity of insurance for economic stability and prosperity, penetration rates remain low throughout much of the continent.

This research seeks to give a complete knowledge of the variables causing Africa's historically low insurance coverage. By focusing on factors and considering countries with varying market dynamics, the study will provide a comprehensive perspective that earlier studies may have overlooked owing to their smaller scope and selective selection of only countries with good penetration rates. Using up-to-date data from 2008 to 2022 provides relevance and accuracy, solving the shortcomings observed in previous studies.

Understanding the drivers of insurance penetration is vital for policymakers and industry stakeholders to develop effective interventions to increase insurance coverage. Social, demographic, and cultural elements are also significant but less easily controlled and quantifiable. This study focuses on economic considerations to provide practical suggestions for increasing insurance coverage. Economic variables often interact with social and cultural aspects, providing a foundation for a comprehensive understanding.

Additionally, by including a diverse group of countries with varying GDP levels, the study hopes to provide a more representative and actionable set of insights that can help policymakers, insurers, and other stakeholders design effective strategies to increase insurance adoption across the continent. The findings of this study have the potential to promote financial inclusion, resilience, economic stability, and risk management for Africa's varied personnel.

CHAPTER TWO

2.0 Literature Review

2.1 History of Insurance

Insurance originated in early European societies where friendly or benevolent organizations provided mutual aid to members with similar professions. Fire societies, for instance, helped members protect goods from burning houses, evolving into mutual insurance companies.

Risk mitigation was common among guilds, trade associations, and maritime nations, which spread cargo across ships to avoid losses from storms and piracy. The insurance profession emerged in the 17th century with maritime trade, as merchants and ship owners formed associations to distribute risk, beginning at Edward Lloyd's coffee house in 1688, leading to Lloyd's of London.

After 1815, insurance spread beyond Europe and the US, initially for European descendants. Otto Von Bismarck's social security programs in 1880s Germany, including pensions and various insurances, influenced global practices.

In sub-Saharan Africa, colonial powers initially dominated insurance, setting up companies to protect their interests. The market expanded with motor insurance, and in 1976, the African Reinsurance Corporation (African Re) was established with African Development Bank support to operate internationally.

2.2 Concept of insurance and insurance penetration

Scholars from across the world have different interpretations of insurance for example Marekia-2012 defines insurance as a means of combining resources to provide financial security against unforeseen events. According to Adesanya, (2013), insurance is a contract whereby an insurer in exchange for a premium becomes security to the insured, that he shall not suffer loss, damage, or prejudice by the happening of the perils specified to certain things which may be exposed to claims.

(Ibrahim and Adeniyi, 2013) find that the insurance penetration rate is the most widely used system of measurement to assess the state of a nation's insurance market. Lucia (2015) conceptualizes insurance penetration as a composite gauge illustrating the contribution of insurance to the Gross Domestic Product (GDP). It serves as a measure for evaluating the development of the insurance sector, computed as the ratio of total

insurance premiums to the gross domestic product in a given year (Insurance Penetration Rate by Country 2022, n.d.).

2.3 Analysis of Literature

2.3.1 Conceptual Framework

This section discusses the underlying ideas and models that underpin our present knowledge of insurance demand. It provides a framework for investigating the determinants of insurance consumption by demonstrating how different economic and behavioral elements have historically been incorporated into the research.

The study of the drivers of demand for insurance dates back to Yaari (1965), who brought the idea of life uncertainty into a framework for describing an individual's lifetime consumption allocation process.

Other factors influencing insurance use were discovered in subsequent investigations. Hakansson (1969), for example, included wealth, income, insurance prices, and interest rates as additional factors that may influence insurance consumption in his model. Karni and Zilcha (1986) also included a measure of risk aversion in their model.

The social learning theory of Bandura (1971) was used to explain the relationship between insurance literacy and insurance inclusion. According to the theory, people learn by modeling, imitating, and observing one another as they engage socially (Bandura 1971).

2.3.2 Theoretical Framework

This section examines and synthesizes current ideas and empirical research on insurance usage. It provides a theoretical foundation for understanding the various factors of insurance demand in Africa, bridging the gap between existing research.

Research on insurance consumption highlights economic determinants, such as income per capita, inflation, interest rates, and financial growth, and socio-demographic determinants such as education and life expectancy. In Africa, some writers, notably Alhassan and Biekpe (2015, 2016), Olayungbo and Akinlo (2016), Balcilar et al. (2020), and (Olarewaju & Msomi, 2021), explored economic and socio-demographic determinants.

Several scholars ((Jahromi & Goudarzi, 2014); Das & Shome,2016; Hwang & Greenford, 2005 and Alhassan & Biekpe) have identified the key variables influencing insurance penetration, such as the inflation rate, exchange rate, insurance price, and economic growth.

(Alhassan&Biekpe,2016) investigated the factors that influenced life insurance consumption in 31 African countries from 1996 to 2010 in their study using simple least squares and GMM estimates, they discovered that institutional quality had a favorable influence on life insurance consumption. They discovered that economic indicators such as GDP per capita and financial development have a positive effect on life insurance demand.

This overview of research such as those by Alhassan and Biekpe, Olarewaju, and Msomi gives a theoretical framework for analyzing the influence of economic and institutional variables on insurance usage in Africa. It establishes the foundation for comprehending the relationship between these variables and insurance demand.

2.3.3 Empirical Literature

According to a 2018 Price Waterhouse Coopers (PwC) report, Africa's insurance coverage rate is unexpectedly low. The survey also discovered that Africa has a history of low insurance penetration due to weak markets and the lack of a strong life insurance industry. Furthermore, the East African Community nations have low insurance penetration rates due to underdeveloped insurance markets, poor legal infrastructure, and a lack of developed banking and capital markets, all of which impede the growth of the insurance industry.

Das & Shome, 2016; Ndalu 2011 suggest there is a positive relationship between income level and insurance uptake. The most current research finds that income has a positive and substantial effect on insurance premiums. Many other researchers (Hammond et al., 1967; Beenstock et al., 1986; Browne & Kim, 1993; Beck & Webb, 2003; Hwang & Greenford, 2005; Steyn et al., 2011; Li et al., 2007; Dragos, 2014; Zerriaa et al., 2017) have also found that income level has a positive and substantial relationship with demand for life insurance.

However, Alhassan and Biekpe (2016) detected a negative relationship between income level and life insurance demand in Africa.

This discrepancy might happen owing to numerous circumstances. For example, Beck and Webb highlighted inconsistent data reporting among countries, low historical data for some regions, and varied degrees of data precision, which hampered the precision of the research, additionally, Ndalu stated that CBS continued to revise the social and economic indicators, resulting in inconsistent information in successive reports and a lack of clarity on which data to use. Another constraint was that most personnel in government agencies were extremely busy and had to be constantly reminded and even encouraged to submit the necessary information, lowering the likelihood of obtaining a more definitive result.

With that, the study will utilize 2008-2022 data, which is easily available for most countries, considering that 2023 data might still be incomplete for some countries of interest.

Furthermore, little research has explored how income distribution influences insurance penetration. High insurance penetration owing to high income per capita may be deceptive if that income is concentrated among a tiny fraction of the population. This

can be critical since insurance coverage may be high in nations with large economic disparity, driven by a rich few rather than the general public. According to (Dragos, 2014), while insurance is more accessible to the upper classes, life insurance may also be inexpensive for the middle classes. Overall, the insurance market will be based on the link between the amount of income and the income distribution which may make the influence of income disparities on the market for insurance unclear.

Garba and Abdulsalam investigated the factors affecting the adoption of insurance services in Nigeria. They handed out four hundred questionnaires to the responders. According to the study's findings, several socioeconomic and economic factors influence how many individuals in Borno State use insurance services(Garba & Jibril, 2011).

(Isedomi & Michael, 2024) In their research on the determinants of insurance penetration in Africa, discovered that economic factors such as inflation, exchange rate, insurance premium, and economic growth have a significant impact on insurance penetration both in the short and long term. In particular, inflation and insurance rates have a positive impact on insurance penetration, but exchange rate volatility and economic growth are detrimental. The study found that inflation had a considerable positive effect on insurance penetration in African nations in the short run. The conclusion on inflation rates is consistent with that of (Smith et al. 2018). According to Smith et al., inflation can encourage demand for insurance products as individuals seek to safeguard their assets and purchasing power.

On the contrary, Sunday et al. (2018) found that the inflation rate had a positive but small influence on insurance penetration in the Nigerian insurance business.

Additionally, Studies conducted by (Perpetua et al., 2018), Alhassan and Biekpe (2016), and Das and Shome (2016) demonstrated that inflation has a negative impact on insurance demand since higher inflation rates reduce the actual purchasing power of low-income earners and overall insurance penetration rates.

This disparity might be attributed to a variety of variables. As an example,(Isedomi & Michael, 2024) considered data over a longer duration (12 years) but concentrated only on six African countries with already high insurance penetration. This focus ignored countries with low insurance penetration, thus not providing a complete picture.

To address this, the study will include at least one country with high, medium, and low GDP levels. We would anticipate nations with high GDP to have higher insurance penetration, whereas those with low GDP would have lower penetration. This method assures that every economic situation is covered in the research. Despite disparities in market dynamics, this strategy provides a more accurate depiction of countries with moderate, high, and low insurance penetration, rather than concentrating solely on those with high penetration rates.

Olayungbo and Akinlo (2016) conducted another empirical study titled "Determinants of Insurance Penetration in Sub-Saharan Africa". They discovered that economic factors, such as income levels and financial development, had positive effects on insurance penetration, but cultural factors, such as financial literacy and risk perception, have the opposite effect. According to the author, rising GDP per capita and disposable income make insurance premiums more affordable, resulting in increased penetration.

Various research on life insurance consumption discovered that financial development had positive effects on life consumption. (Outreville, 1996; Steyn et al., 2011; Beck & Webb; Alhassan & Biekpe, 2016). However, a significant relationship between these segments cannot be deduced as confirmation of connectivity (Beck & Webb, 2003).

Beyond that, research by Leonard M. Nkotsoe discovered that using the Fixed Effect (FE) approach, inflation, health spending, and age dependence factors were relevant in explaining life insurance uptake. Inflation contributed positively to life insurance demand, but financial development was negative and minor. Furthermore, variables such as income, financial development, higher education, and urbanization, which have been shown in several studies to have a substantial effect on life insurance, do not predict life insurance in the SADC area.

This might be due to the sample used or the lack of data for some countries, therefore impacting the results of the two models cannot be measured.

(Luvisia, 2018) studied the factors influencing insurance penetration in Nairobi, Kenya. The study included all forty-seven insurance companies, the insurance regulator, and the Association of Kenya Insurers. The research demonstrated that customer factors such as convenience of purchase, product awareness, and related benefits impact insurance companies' market share. Other variables influencing market penetration were the insurance industry's reputation, product pricing, and adoption of modern

technologies. Life insurance's decreased cost is likely to promote demand among individuals with higher incomes. Insurance penetration was unaffected by competition from new providers. The study discovered that macroeconomic variables were the most influential, followed by product, customer, and institutional factors.

Empirical research has revealed that there is a solid correlation between education and the uptake of life insurance((Kamau, 2013); (Dragos, 2014)). According to Outreville (2015), more education makes people more aware of the insurance products they need. Pradhan et al. (2016) concluded that there is a positive correlation between higher education and insurance product adoption.

Coulibaly (2021) discovered that religion, cultural taboos, and beliefs all had a negative impact on insurance consumption in Kenya. Finally, the study found that lack of education has a negative effect on the uptake of insurance in Kenya.

Dr. Ben Kajwang's research on the factors influencing the low penetration of insurance services in Africa found that it was impossible to ascertain if limited education was a factor in the low insurance rate. (Kajwang, 2020)

Furthermore, (Chibisa et al. 2018) investigated the influence of cultural values, as evaluated by Hofstede's dimensions, on insurance penetration, offering useful information on the issue. The study's findings indicate that individualism, and uncertainty avoidance, have a positive effect on insurance uptake in Sub-Saharan Africa. Individualism is a quality that illustrates how people prioritize their interests over shared aims. The paper revealed that higher degrees of individualism in a culture correlate with higher insurance penetration.

(Beck & Webb, 2003) researched over sixty-eight nations throughout the world to determine the causes of differences in insurance uptake. They conducted their research using four distinct life insurance consumption variables as well as several economic, demographic, and institutional aspects. They discovered that countries with high income per capita consume more life insurance, while other factors such as education, and the size of social security have no significant impact on insurance consumption.

Although little research on insurance literacy has been completed, empirical data indicates that people who lack insurance knowledge are unable to make rational

insurance decisions (Driver et al. 2018). Thus, insurance literacy has a direct and considerable effect on behavioral intent (Tennyson 2011).

Ademilokun et al. (2019) used a structured questionnaire delivered to investigate the impact of financial literacy on insurance uptake. The study sheds light on an essential component of insurance penetration. Financial literacy is critical for individuals' capacity to make decisions, including the decision to purchase insurance. The study's findings imply that Nigerians have a significant lack of financial literacy, contributing to the country's poor insurance adoption rates. Individuals may be unable to recognize the value and necessity of insurance coverage due to a lack of information on insurance products, their advantages, and the insurance business in general.

Furthermore, other experts, such as Giné et al. (2008), have identified an absence of insurance knowledge as a significant barrier to insurance purchasing. People who are financially aware are more likely to want more insurance (Cole et al., 2013).

Nevertheless, (Dercon et al. 2012) found that financial literacy doesn't affect demand for insurance. Given that financial literacy does not imply insurance literacy, knowing how individuals deal with risks and uncertainties becomes difficult (Lin et al. 2019). Furthermore, Lusardi et al. (2017) argue that insurance knowledge and awareness do not always result in higher insurance demand.

In their study, Mamadou and Nelson (Bah & Abila, 2024) discovered that institutional quality had a positive and substantial influence on insurance penetration in Africa, which is consistent with earlier findings. They highlighted regulatory quality, rule of law, corruption control, political stability, and government effectiveness as major influences on insurance penetration. For example, Ghana's excellent regulatory structure and dedication to openness are credited with contributing to the country's significantly higher insurance penetration rate in the region.

In 2017, Otedo performed research to assess the barriers to entry for general insurance providers into the Kenyan market(Otedo, 2017). The survey included 10% of Kenya's 44 licensed insurance enterprises, chosen at random. According to the findings, the majority of survey respondents saw product differentiation as a critical internal aspect that helps insurance businesses penetrate the market. The study also identified price, customer service, management abilities, human resources, client communication, asymmetry, and switching costs as internal variables driving market penetration for

general insurance businesses in Kenya. External variables influencing market penetration for Kenyan general insurance businesses included government policy and regulation, market circumstances, and strategic collaborations.

According to the findings of Srijanani and Rao's (2019) research on the market penetration challenges faced by general insurance firms in Zimbabwe, product offering is critical in ensuring that product development and marketing efforts consistently meet local demand, particularly for insurance products. This shows that a successful savings mobilization effort will require both high-quality product offerings and good marketing. All of these elements contribute to the institution's growth.

According to a KPMG report on the challenges and opportunities in Africa's insurance sector, which highlights low penetration rates due to a lack of awareness and trust, poor infrastructure, and shallow financial markets, South Africa dominates the market, particularly in life insurance, while the rest of the continent lags. Despite its low GDP per capita, South Africa has a high penetration rate due to market competition, a rich portion capable of paying insurance, trust in financial systems, and high-risk awareness. A growing middle class, urbanization, a competitive market, a well-developed financial sector, and innovation all contribute to Kenya's expanding penetration. However, North Africa, excluding Morocco, has restraints such as hard economic environments, investment restrictions, a shortage of trained labor, and unfavorable tax regimes, with religion also influencing the growth of the private insurance sector. (*Insurance-in-Africa-2015.Pdf*, n.d.)

Additionally, Dr. Ben Kajwang found that lack of means, mistrust of financial service providers, shallow financial markets, lack of reliable information, poor legal systems, nature of the insurance industry, cost of insurance, and demographic factors are contributors among the reasons behind low insurance penetration. (Kajwang, 2022)

According to(Guerineau & Sawadogo, 2015), the age-population ratio is the ratio of individuals who are generally dependent to those who are usually in the active labor force, and it is used to quantify the burden on the productive workforce.

(Kjosevski, n.d.) performed cross-panel research on life insurance parameters in Europe. The results showed that inflation, health spending, education level, rule of law, and GDP per capita all had an impact on demand for life insurance. The study also

found that real interest rates, young and elderly dependence ratios, corruption control, and government performance did not affect life insurance demand (Kjosevski 2012).

In contrast, (Beenstock et al., 1986), and (Zerriaa et al., 2017) found that age dependency plays an important role in life insurance demand.(Beck & Webb, 2003) discovered a negative relationship.

CHAPTER THREE

3.0 Methodology

This section discusses the approach used to examine the factors influencing insurance penetration in African countries using quarterly data from 2008 to 2022. It details the data collection, research design, population, sampling, model, and data analysis strategies used in the study.

Following a similar strategy to (Beck & Webb, 2003), the research will employ a variety of recently recognized factors to quantify insurance penetration in Africa: income levels, inflation rate, premium levels, GDP, and so on. An expo-facto design was chosen because it allows the analysis of current data without adjusting variables, as well as the assessment and achievement of research objectives while swiftly addressing the research questions. This is appropriate for assessing the influence of a range of factors on insurance penetration in various African countries throughout the given period. These factors will be studied using a panel regression analysis specifically the Auto Regressive Distributed Lag mode.

Because some data may be missing or biased, the study will cover the years 2008–2022, with the assumption that data for 2023 and 2024 is incomplete. The comprehensive methodology is given in the following sections.

3.1 Hypotheses

- There exists a positive relationship between GDP and insurance penetration rates

This hypothesis proposes that greater GDP levels should be related to higher insurance penetration rates. The idea is that when a country's GDP rises, so does wealth and economic stability, which can lead to increased demand for insurance products as people and corporations seek to secure their assets.

- A higher young-age dependency ratio has a positive relationship with insurance penetration rates.

A higher proportion of young dependents in a population drives increased insurance uptake, as households seek financial protection against health and education-related risks.

- There exists a positive relationship between high inflation and insurance penetration rate in fairly developed economies and a negative relationship for struggling economies.

Insurance penetration, the ratio of total insurance premiums to GDP, is an imperfect measure of insurance consumption as it combines price and quantity; in an inflationary environment, rising insurance premiums reflect higher costs rather than increased consumption, while inflation erodes purchasing power, reducing the quantity of insurance purchased. Consequently, the study hypothesizes that inflation negatively impacts insurance penetration

3.2 Research Design

The research design is a strategy for logically and cohesively integrating the many components of the study to ensure that the researcher is properly addressing the research issue; it serves as the framework for data collecting, measurement, and analysis (Vaus, 2001). Explanatory, descriptive, causal, correlational, and case studies are among the study strategies used (McCombes, 2021).

This study will use an expo facto design as it compares groups with pre-existing characteristics on a dependent variable. It is considered quasi-experimental since the individuals are grouped based on a certain attribute.

This method ensures that the study investigates how the independent factors that existed before the investigation impact the dependent variables. Furthermore, countries were picked to represent low, high, and moderate GDP levels in Africa.

The research will conduct a hypothesis test since it is attempting to explore the relationship between the variables. Following that, a panel data regression analysis (particularly the Auto Regressive Distributed Lag (ARDL)) will be performed to evaluate the relationship between insurance penetration and other parameters, while accounting for time-invariant factors such as culture, which influence insurance penetration. The ARDL model was chosen because it is flexible and does not need variables to be integrated in a particular order. Variables integrated at the order I (1) i.e., stationary at level, and I (0) i.e., stationary at the first difference can be utilized (Gerni et al. 2013). This approach yields consistent and reliable estimates of asymptotically normal long-run coefficients, independent of order (I (0) or I (1)).

A unit root test will be used to guarantee that the regressors are either stationary at level, I (0), stationary at first difference, I (1), or a combination of the two but not more than or equal to I (2). This will give the study clearance.

3.3 Population and Sample Size

A research population is a large group of individuals or items that are important to a scientific investigation and have similar characteristics (Explorable, 2009), whereas a sample is the selection of a subset of the population of interest because the researcher cannot study the entire population and thus relies on a smaller group for data collection (Dana, 2020).

The target population includes the whole continent. Following the vast number of African countries, the study will cover different countries in the five African regions with each country representing a high, moderate, or low GDP to form the representative sample. This was chosen to prevent inaccuracies in results caused by picking a limited sample of nations to represent Africa, as well as selecting only countries with high insurance penetration and established financial systems in Africa.

3.4 Research Instruments and Data Collection Procedure

3.4.1 Research Instruments

The study mostly gathered secondary data. Kabir (2016) finds that secondary data is less expensive and time-consuming for the researcher, providing an advantage over primary data, and given time restrictions, this is achievable. Secondary data originates from reputable websites such as the World Bank, Swiss Re, and public papers materials and analyses of the different regulatory bodies.

3.4.2 Data collection

According to Northern Illinois University, data collection is the systematic acquisition and analysis of qualitative and quantitative data on variables of interest to answer research questions, test hypotheses, and assess outcomes.

The study relied on secondary data. Data gathering on income levels, income distribution, GDP, inflation rate, insurance penetration rates, etc. included downloading regulatory organizations' reports on the insurance performance of the countries under examination, as well as insurance reports from insurance businesses in those countries.

Other sources included the World Bank, Swiss Re, and insurance regulatory authorities. These sources provide the trustworthy and complete data required for determining the factors influencing insurance penetration in Africa.

Several aspects were considered. However, the decision on what factors to include in the study was influenced by the availability of data. Furthermore, the data period was determined by the necessity to use current data to reflect current economic and market dynamics, as well as data availability.

To guarantee robustness, the study includes data from 2008 to 2022, allowing for a more current investigation of insurance penetration patterns and factors across the selected countries.

3.5 Data Analysis and Presentation

3.5.1 The Auto-Regressive Distributed Lag

One would argue that running different regressions with each of the variables in the different years and using before and after or difference analysis could work, however, this approach may only be suitable for analysis over two years.

As a result, this study will employ panel or longitudinal data regression to better understand the relationship between the phenomena while keeping other variables constant. Panel data consists of data from ***n*** distinct entries (the 8 countries) that are monitored across T periods.

The study will employ an autoregressive distributed lag model since it is flexible, and the pre-testing glitches observed in other cointegration strategies will be avoided using panel data ARDL estimation. The study will use quarterly data for 15 years since more observations minimize standard errors.

First, as previously indicated, a unit root test will be performed to demonstrate that the data is valid and that all variables in this research were stationary at level and order one, allowing the ARDL model to be considered relevant.

The study will next use the Pesaran scaled CD to confirm that there is no cross-sectional dependence on residuals across the eight countries.

The investigation will then identify the optimal lag length. The optimal lag is the one with the lowest Bayesian Information Criterion and Akaike information criterion values i.e. a lower Akaike information criterion and Bayesian Information Criterion value conduces to a better model.

The substitution of the equation;

$$\Delta IPit = q0 + \sum_{g=1}^{n} \beta 1g\Delta IPit - g + \sum_{g=1}^{n} \beta 2g\Delta INFit - g + \ldots + \sum_{g=1}^{n} \beta 7g\Delta PRINit - g + \forall 1IPit - 1 + \forall 2INFit - 1 + \ldots + \forall 7PRINit - 1 + \mu it$$

Where;

- ΔIP_{it} is the dependent variable (insurance penetration)
- q_0 is the constant term
- g is the selected number of lags
- Δ is the first difference
- μ_{it} is the composite error term
- β_k are the coefficients that represent the relationship between the independent variables and the dependent variable.
- IP – insurance penetration, INF-inflation rate, PRIN- premium income, ODR-Old dependency ratio, YDR-Young dependency ratio, GDP-Gross Domestic Product, and INC-Income levels

The study will apply the panel ARDL to survey the short and long-run relationship using the null hypothesis $Ho = \forall 1 = \forall 2 = \forall 3 = \forall 4 = \forall 5 = \forall 6 = \forall 7 = 0$ and the Error Correction Model (ECM), the model will then be:

$$\Delta IPit = q0 + \sum_{g=1}^{n} \gamma 1g\Delta IPit - g + \sum_{g=1}^{n} \gamma 2g\Delta INFit - g + \sum_{g=1}^{n} \gamma 3g\Delta INCit - g + \sum_{g=1}^{n} \gamma 4g\Delta GDPit - g + \sum_{g=1}^{n} \gamma 5g\Delta PRINit - g + \sum_{g=1}^{n} \gamma 6g\Delta YDRit - g + \sum_{g=1}^{n} \gamma 7g\Delta ODRit - g + \partial ecm + \varepsilon it$$

Where;

$\gamma 1 \ldots \gamma 7$ are dynamic short-run model coefficients and the speed of adjustment is denoted by ∂.

The other factors are:

ORD-Old Age dependency ratio, YDR -Young age dependency ratio.

Finally, the study will estimate the panel ARDL and the recursive CUSUM test to check the reliability of the estimations conducted.

CHAPTER FOUR

The models for this study were introduced in the previous chapter. This section includes original findings and explanations for the observed models. The World Bank and insurance regulatory bodies in the selected nations provided the vast majority of the data needed for the study. The analysis method used panel data auto regression distributed lag. This method was appropriate for the study because it involved studying several insurance determinants against insurance penetration across various countries and years, and it is a highly recommended approach that has been used by scholars in previous studies such as(Olarewaju & Msomi, 2021).

4.1.1 Unit root test

The unit root test is commonly used to explain data reliability and analytical results. Table 1 reveals that all of the variables in this study were stable at level and first difference, with the exception of the young age dependence ratio and inflation, which are not stationary at level and have all probability values significant at 1, 5, and 10%, respectively. Categorically, the dependent variable, insurance penetration rate, was stationary at the first difference, allowing the cointegration test for the variables. This outcome is consistent with Pesaran et al.'s (2001) theory, indicating the use of a P-ARDL model.

Table 1

Variable	statistic	Level	p-value	statistic	1st Diff	p-value
IP	-4.3802	I (0)	0.01	-16.73	I (1)	0.01
INS PRE	-4.3974	I (0)	0.01	-16.368	I (1)	0.01
INF	-2.5587	I (0)	0.3418	-11.637	I (1)	0.01
YOUNG	-2.1749	I (0)	0.5043	-9.2304	I (1)	0.01
OLD	-7.3837	I (0)	0.01	-12.965	I (1)	0.01
GDP	-0.39036	I (0)	0.01382	-9.7699	I (1)	0.01
INCOME	-3.1843	I (0)	0.09064	-13.288	I (1)	0.01

4.1.2 Cross-sectional dependence

A residual cross-sectional reliance (RCD) test was used to ensure that there was no cross-sectional dependency between countries and to verify the appropriateness of the panel data model utilized in this study. The Pesaran cross-dependency (CD) test was employed in this study to see if the residuals were connected.

The null hypothesis (H0) states that there is no cross-sectional dependency and that the p-value exceeds the significance criteria (e.g., 0.05 or 0.01). Thus, the null hypothesis cannot be rejected. This means that there is no significant evidence of cross-sectional dependency on the data at the 5% level.

According to the findings in Table 2, the null hypothesis is accepted whereas the alternative hypothesis is rejected. As a result, at the 5% significance level, no cross-sectional dependence was found for this study.

Table2

Cross-sectional dependence	
The Pesaran test	
Z (test statistic)	p-value
1.5812	0.11938

4.1.3 Optimal Lag Selection and Justification of Selected Model

ARDL allows for an appropriate lag selection of more than two lags, making it more helpful than other conventional cointegrating algorithms (Giles 2013). The optimum lag number is defined as the one with the smallest Akaike information criteria. A lower AIC value is regarded to indicate a better model (Bahmani-Oskooee and Brooks 2003). Thus, the ideal lag for this study is six, which has the lowest AIC and BIC values, as shown in Table 3.

Table 3

Optimal lag									
lag	1	2	3	4	5	6	7	8	9
AIC	-924.4723	-926.5795	-927.7685	-924.1109	-937.7218	-943.9703	-928.262	-920.901	-917.6229
BIC	-910.8962	-913.0034	-914.1924	-910.5348	-924.145	-930.3942	-914.686	-907.325	-904.0468

4.1.4 Test for long-run relationships

Furthermore, the Johansen cointegration test revealed a cointegration relationship among the variables in this study. Table 4 shows that there are several long-run relationships (both positive and negative) among the variables.

Null Hypothesis (H_0) There are at most ***r*** cointegrating connections.

Table4

r	T-statistic	Critical value at 5%	Conclusion
r=0 (no cointegration)	212.23	131.70	Reject H_0. At least one cointegrating relationship exists.
r<1	135.14	102.14	Reject H_0. At least two cointegrating relationships exist.
r<2	82.82	76.07	Reject H_0. At least three cointegrating relationships exist.
r<3	51.02	53.12	Fail to reject H_0. At most two cointegrating relationships exist.

Based on the results from the Johansen Cointegration Analysis, the variables that have a long-run relationship with Insurance Penetration are:

Insurance Premium: A coefficient of -5.695 implies that as the Insurance Premium increases, the Insurance Penetration Rate tends to decrease in the long run, all else being equal.

Inflation: A coefficient of -0.219 indicates a slight negative near-long-term association between inflation and insurance penetration which is consistent with the study's hypothesis and the findings of Hwang and Greenford (2005), Alhassan (2016), and Alhassan and Biekpe (2016).

Age Dependency Ratio (Young): A coefficient of 1.728 indicates that as the number of young people compared to the working-age population grows, so does insurance penetration.

Age Dependency Ratio (Old): A coefficient of -3.254 indicates that when the share of the elderly (old dependency ratio) rises compared to the working-age population, the

Insurance Penetration Rate falls in the near long term. This is consistent with the findings of Zerriaa and Noubbigh (2016), Alhassan and Biekpe (2016), Das and Shome (2016), and the life cycle theory, but contradicts the findings of Zerriaa et al. (2017).

GDP: A -0.921 coefficient implies a negative long-run association between GDP and insurance penetration. This shows that, in the long run, as the economy expands, insurance penetration falls, which might be related to increasing financial stability or market saturation.

Income per Capita: A coefficient of 8.319 suggests a significant positive long-run relationship between adjusted net national income per capita and insurance penetration. This is consistent with Ndalu (2011), Dragos (2014), Çelik and Kayali (2009), and Zerriaa et al. (2017).

4.2.1 Model Estimation

From the short-run estimates, all the factors examined at various lagged periods are insignificant at either 1, 5, or 10%, except for some of the lagged periods that are significant e.g. Insurance Premium is significant at lag 5 and the young age dependency ratio is significant at lag3. As shown by a sample in Figure 1 and Figure 2.

Figure 1

Coefficients:

	Estimate	Std. Error	t-value	Pr(>|t|)	
lag(Insurance.penetration.rate, 3)	-0.125416	0.124639	-1.0062	0.324344	
lag(Insurance.premium..USD..million, 3)	0.195840	0.125739	1.5575	0.132439	
lag(Inflation..consumer.prices..annual..., 3)	-0.013168	0.015835	-0.8316	0.413832	
lag(Age.dependency.ratio..young....of.working.age.population., 3)	0.350143	0.114755	3.0512	0.005493	**
lag(Age.dependency.ratio..old....of.working.age.population., 3)	-0.082720	0.089935	-0.9198	0.366846	
lag(GDP..current.US.., 3)	-0.077666	0.131111	-0.5924	0.559147	
lag(Adjusted.net.national.income.per.capita..current.US.., 3)	0.113195	0.122549	0.9237	0.364851	

Signif. codes: 0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Figure 2

Coefficients:				
	Estimate	Std. Error	t-value	Pr(>|t|)
lag(Insurance.penetration.rate, 5)	-1.1721664	0.3707865	-3.1613	0.0158995 *
lag(Insurance.premium..USD..million, 5)	9.8723781	1.6416505	6.0137	0.0005349 ***
lag(Inflation..consumer.prices..annual..., 5)	-0.0165508	0.0206025	-0.8033	0.4481933
lag(Age.dependency.ratio..young....of.working.age.population., 5)	0.2707478	0.2850725	0.9498	0.3738686
lag(Age.dependency.ratio..old....of.working.age.population., 5)	0.0051485	0.1516360	0.0340	0.9738623
lag(GDP..current.US.., 5)	0.0117329	1.1101250	0.0106	0.9918623
lag(Adjusted.net.national.income.per.capita..current.US.., 5)	0.0053940	0.3955241	0.0136	0.9894997

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

In the short run, all variables influence insurance penetration, but only the insurance premium and the young age dependence ratio have a significant influence.

In contrast to the near long-run estimate, insurance premium at lag 3 has a positive influence on insurance penetration, as seen in Figure 1, whereas other factors follow the same relationship direction as the near long-run estimates.

Insurance premiums and penetration may vary owing to perceived value, risk awareness, economic changes, and market conditions. In the short term, an increase in rates may indicate improved coverage, dependability, or more perks, enticing more people to buy insurance despite the increased cost. Economic adjustments may also occur, as people or firms may have enough cash or savings to absorb premium rises without changing their participation in the insurance market.

Rising prices can put a strain on home and business budgets in the near term, causing many to forego insurance entirely. People will choose their urgent needs above insurance.

Cultural and informal alternatives may deter individuals from using formal insurance systems, resulting in lower penetration. While customers may bear increased premiums in the short-term owing to acute necessities, risk knowledge, or stable economic conditions, rising rates over time may cause affordability concerns, discontent, and decreased demand. Insurers must strike a balance between pricing strategies for growth.

For long-run estimates, all variables examined were significant except GDP and Old age dependency ratio as shown in Figure 3.

Figure 3

```
Coefficients:
                                                  Estimate Std. Error t value Pr(>|t|)
(Intercept)                                      1.448e-02  5.113e-03   2.832  0.00617 **
Insurance.premium..USD..million                  3.285e-06  2.395e-07  13.714  < 2e-16 ***
Inflation..consumer.prices..annual...           -5.093e-04  2.372e-04  -2.147  0.03557 *
Age.dependency.ratio..young....of.working.age.population. -3.266e-04  1.557e-04  -2.097  0.03992 *
Age.dependency.ratio..old....of.working.age.population.   1.064e-03  1.061e-03   1.003  0.31966
GDP..current.US..                               -1.932e-14  1.208e-14  -1.599  0.11468
Adjusted.net.national.income.per.capita..current.US..    -8.316e-06  4.102e-06  -2.027  0.04679 *
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

4.2.2 Error Correction Term

Rabbi (2011) and Rabbi et al. (2013) posited that a very significant cointegrating error correction term (ECT) is a revelation of the existence of a stable long-run relationship between the variables of the study. Using a period lagged ECT cointegration among variables is further confirmed. The coefficient of error correction reveals the speediness at which the variables go back to equilibrium, and hence, adjust to the accurate direction.

Figure 4

```
                Estimate  Std. Error t-value Pr(>|t|)
ECT (-1)  -1.8041e-01  1.7521e-01 -1.0297 0.03567 *
```

Generally, ECT must have a negative sign and be statistically significant. –0.18041 reveals that the previous disequilibrium takes a reasonable speed of about 18% to regulate to long-run equilibrium every quarter over the years. Furthermore, the probability value of 0.03567 reveals statistical significance at 5%, which is an assurance that the long-run equilibrium is achievable quarterly. Thus, there is a steady, stable, and consistent long-run relationship among the variables of this study.

4.3 Stability of the model.

To determine the stability of the model and test parameter stability, a CUSUM test was conducted. From Figures 5.1 and 5.2, the CUSUM test reveals the stability and steady nature of the variables used in the study. The CUSUM test conducted in this study shows the stability of the model. This is because the black line falls between the two red/restricted lines, and this justifies the stability, reliability, and effectiveness of the model with stable recursive. This implies that the results of the model are reliable and meaningful.

Figure 5.1

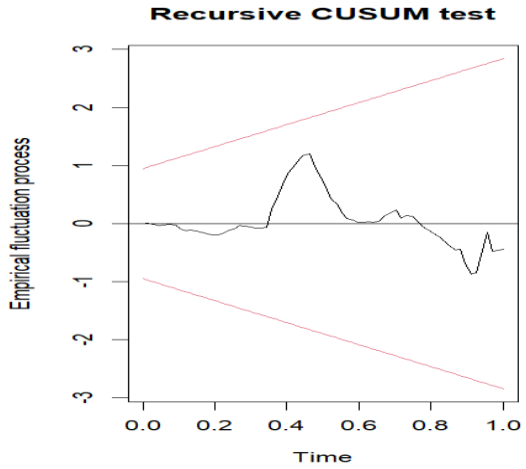
```
Recursive CUSUM test
data:  cusum_test
S = 0.62372, p-value = 0.3694
```

Since the p-value (0.3694) is greater than the common significance level (0.05), we fail to reject the null hypothesis of model stability i.e. there is no statistical evidence of structural instability in the model over the observed period.

This aligns with the CUSUM plot you provided, where the cumulative fluctuation process (black line) remained within the critical bounds (red dashed lines). Visually and statistically, the model appears stable as shown in Figure 5.2

Hence, the model's parameters are consistent over time, and there is no need to adjust for structural breaks or re-specify the model due to instability.

Figure 5.2



CHAPTER FIVE

This chapter includes an extensive analysis of the study's findings, with a focus on how the relationships between the key variables and insurance penetration change over time. It assesses whether the results obtained are consistent with the study's aims and the strength of the underlying evidence. Additionally, this chapter highlights and verifies the study's limitations, indicating areas for additional investigation and improvement. The goal of the chapter's discussions is to combine the study's findings, recommend courses of action for improvement, and propose future research directions.

5.0 Discussion of the Results

5.1 Near long-run estimates

The near-long-run results based on the results from the Johansen Cointegration Analysis indicate:

There is a negative correlation between a country's insurance penetration rate and insurance premiums. Specifically, when insurance premiums rise, the insurance penetration rate tends to fall, all else equal. This tendency might be ascribed to individuals foregoing premium payments in the near long term when premiums become increasingly expensive due to competing financial priorities.

Furthermore, in places such as Africa, where many people rely on community-based safety nets like informal insurance, growing costs discourage continuing participation in official insurance programs. For many, the expense of premiums surpasses the perceived advantages, especially given widespread financial difficulties. Furthermore, income shocks caused by pandemics or other unanticipated occurrences can dramatically affect disposable income and cash flow. In such circumstances, increased rates worsen the financial burden of insurance, leading many to forgo coverage altogether and consequently, insurance penetration rates decline.

There is a modest negative near-long-term relationship between inflation and insurance penetration. This suggests that higher inflation may be associated with reduced insurance penetration, consistent with the findings of Hwang and Greenford (2005), Alhassan (2016), and Alhassan and Biekpe (2016), who found that inflation reduces the value of insurance services. Das and Shome (2016) on the other hand found that

inflation can increase uncertainty and dread about the future, pushing people to spend more on insurance to protect their lives and possessions.

However, in many African nations, where a sizable proportion of the population lives below the poverty line in comparison to other continents, inflation erodes already scarce resources. This makes it difficult for individuals to prioritize insurance above basic needs, as they are already struggling to meet basic needs.

The Age Dependency Ratio (Young) shows a positive near-long-run relationship between the proportion of young dependents and insurance penetration. As the number of young dependents increases, parents and guardians may seek life, health, or education policies to ensure their children's well-being. Governments and employers may also promote group insurance schemes to support family financial stability. This trend is particularly relevant in developing economies where a lack of robust social welfare systems often shifts risk management to families and individuals. However, the extent of this relationship can vary based on socioeconomic factors like income levels, insurance awareness, and availability of affordable insurance options, etc.

The Age Dependency Ratio (Old) has a coefficient of -3.254, indicating that as the proportion of elderly dependents increases, the Insurance Penetration Rate tends to decline over the near-long term. This aligns with research by Zerriaa and Noubbigh (2016), Alhassan and Biekpe (2016), Das and Shome (2016), and the life cycle theory. However, it contradicts the findings of Zerriaa et al. (2017), which suggest a more nuanced relationship between aging populations and insurance demand. The decline in insurance penetration can be attributed to the strain that an aging population places on economic resources, such as reduced real income per capita and reduced discretionary spending on insurance products. The elderly may deprioritize insurance purchases due to reduced earning capacity or perceptions that their immediate financial risks are already mitigated. In developing economies, social security systems are less developed, and familial support networks take precedence over formal insurance.

The relationship between GDP and insurance penetration is negative, suggesting that as the economy expands, insurance penetration tends to decline. This may be due to factors such as financial stability improving, market saturation, and structural changes. As economies grow and develop, the perceived need for insurance decreases, leading to individuals and businesses relying on savings, investments, or other financial

mechanisms as substitutes. Market saturation also plays a role, as a significant portion of the population has already acquired adequate coverage, particularly for life insurance or other long-term products. Structural changes, such as diversification and urbanization, can alter demand patterns, and rising inequality in rapidly growing economies may limit the participation of low-income groups in the insurance market. However, this does not mean insurance becomes irrelevant. Instead, it highlights the need for innovation in insurance products and services to meet evolving consumer demands. Policymakers and insurers must focus on addressing coverage gaps, developing tailored solutions for underserved markets, and promoting financial literacy to ensure insurance remains accessible and relevant in growing economies.

The coefficient of 8.319 indicates a strong positive association between adjusted net national income per capita and insurance penetration in the near long run. This aligns with Ndalu (2011), Dragos (2014), Çelik and Kayali (2009), and Zerriaa et al. (2017) that insurance costs less as income grows. Per capita income, which was used as a proxy for income, depicts a country's standard of living. This has a huge and positive influence on the insurance sector penetration since individuals find it affordable, and the insurance business is one of the most important parts of an economy's financial system.

This shows that variables such as income levels and the demographic structure of the population (particularly the young dependence ratio) drive insurance uptake in the near long run, but economic variables like inflation, GDP, and aging populations appear to hinder it.

5.2 Overall discussion

Insurance premiums

According to the study's findings, the relationship between insurance premiums and penetration is positive in the short run, negative in the near long term, and positive in the long run, which may be explained by dynamic economic and behavioral variables.

Rising premiums in the short term may indicate higher risk awareness or enhanced insurance services, which might temporarily promote uptake. For example, following a natural disaster or economic shock, customers may see higher premiums as reasonable, resulting in increased uptake. Researchers such as Das and Shome (2016) observe that

increased anxiety or uncertainty might temporarily boost demand for insurance despite growing costs.

As premiums continue to rise, affordability concerns arise, particularly in low- and middle-income countries. Long-term premium hikes put a burden on household budgets, resulting in policy lapses or reduced new policy purchases. Alhassan and Biekpe (2016) and Zerriaa and Noubbigh (2016) demonstrate how income shocks and financial limitations during inflationary periods might limit the ability to continue premium payments, resulting in lower penetration rates.

In the long run, economic development, financial literacy, and innovation in insurance products may recover and improve penetration rates, even with increased premiums. As economies stabilize and disposable incomes improve, consumers may return to the market. In addition, insurers respond to market situations by providing flexible payment alternatives or combining plans to appeal to a wide range of income levels.

Researchers such as Arena (2008) argue that in the long run, the positive association between economic development and insurance uptake resurfaces as greater income levels and financial sophistication surpass cost concerns.

To summarize, this cyclical tendency shows the complex interplay of economic cycles, consumer behavior, and market dynamics, emphasizing the necessity for insurers to employ adaptive tactics to sustain penetration over different periods.

Inflation rate

The study's consistent findings support the hypothesis that inflation has a negative effect on insurance uptake in developing countries. This persistent association demonstrates the extensive influence of inflation on both economic and cultural characteristics in these economies. Inflation reduces disposable income, making it more difficult for people to buy insurance products. This is consistent with studies by Das and Shome (2016) and Alhassan and Biekpe (2016), who found that greater inflation rates diminish the actual value of income and raise the cost of living, making insurance expensive for low-income groups.

The results' persistent negative impact on inflation is especially worth noting in African countries, where many people are already facing economic restrictions. As the study and literature analysis demonstrates, cultural variables heighten this difficulty.

Communal traditions in these countries frequently serve as informal safety nets, minimizing the perceived need for official insurance systems. Chibisa et al. (2018) and Coulibaly (2021) found that communal and familial support structures inhibit insurance uptake, particularly during periods of economic stress induced by inflation.

Perpetua et al. (2018), Alhassan and Biekpe (2016), and other academics also found that inflation consistently has a negative impact on insurance demand in developing countries, lending credibility to this long-term association. While some research, such as Smith et al. (2018) and Isedomi and Michael (2024), suggests that inflation can drive short-term insurance uptake as people seek to protect their assets, these findings are frequently limited to specific contexts, such as countries with high insurance penetration or higher-income groups. In contrast, the study's findings highlight that inflation continually reduces insurance coverage in developing countries due to its broad and pervasive economic constraints.

These results stand out from previous studies because they consistently demonstrate a negative relationship across diverse periods (short, near long, and long run) and circumstances. It emphasizes the need to consider regional differences, especially in low-income, inflation-prone nations. By reinforcing the long-term negative impacts of inflation on insurance penetration, the study contributes to the literature by providing a clear and complete view of the problems of marketing insurance in developing countries where inflation is a recurring impediment.

Young age dependency ratio

According to the study's findings, the relationship between the young age dependence ratio and insurance penetration follows a distinctive trajectory. It is positive in the short and near long term but turns negative in the long run. This subtle dynamic emphasizes the changing influence of demographic trends on insurance demand.

In the short and near long term, an increasing young-age dependence ratio boosts insurance uptake which is consistent with the study’s hypothesis. This is also consistent with the assumption that families with more dependents frequently seek insurance products, such as life or health insurance, to provide a financial safety net against unanticipated calamities. Scholars such as Das and Shome (2016) and Beck and Webb

(2003) proposed that having young dependents increases the perceived value of insurance, prompting households to prioritize coverage. Furthermore, increasing awareness of younger people's educational and healthcare demands may increase demand for insurance policies suited to their needs.

However, this association becomes negative in the long run. As the share of young people in the population increases, working-age people face enormous financial strain. Over time, this strain may lower disposable income and limit households' capacity to pay insurance premiums. The life-cycle hypothesis offers a theoretical framework for analyzing this trend, arguing that when resources are redirected to address urgent consumption requirements, long-term financial planning, including insurance, suffers. Researchers such as Zerriaa and Noubbigh (2016) and Alhassan and Biekpe (2016) also noted a decline in insurance uptake as economic resources are stretched thin due to population pressures.

The shift from a positive to a negative connection highlights the dual nature of young age reliance as both a driver and a barrier to insurance penetration, depending on the period. This change is consistent with previous research while providing a more precise timing for this shift in the context of developing economies. The work contributes to knowledge of how demographic changes impact insurance demand, particularly in locations with high dependence ratios, by illustrating the temporal unpredictability of this connection.

Old age dependency

According to the findings, the relationship between the old-age dependence ratio and insurance penetration shifts from negative in the short and near-long run to positive in the long term. This dynamic illustrates the growing social and financial issues faced by an aging population, as well as how they affect insurance demand over time.

In the short and near-long term, the connection is negative, consistent with the findings of Zerriaa and Noubbigh (2016) and Alhassan and Biekpe (2016). As the share of elderly dependents grows in comparison to the working-age population, the productive workforce faces financial hardship. This pressure frequently reduces discretionary income, lowering the affordability and use of insurance policies. Furthermore, in developing nations, the importance of family structures and informal caring networks reduces the need for formal insurance. The life-cycle theory supports this idea,

emphasizing that when resources are transferred to assist older dependents, households may deprioritize expenses such as insurance premiums.

However, the relationship gradually becomes positive with time. This trend can be ascribed to larger economic changes and institutional reactions to an aging population. As nations grow, their financial systems frequently change to meet the demands of retirees, resulting in the emergence of specialized products such as annuities, pensions, and long-term care insurance. Increased longevity and knowledge of health and end-of-life expenditures are driving up demand for insurance as a method of ensuring financial security. According to Das and Shome (2016), aging populations in wealthy countries rely more on formal insurance to offset healthcare and retirement risks.

The shift from a negative to a positive connection emphasizes the impact of macroeconomic and demographic trends on insurance demand. In developing countries, the initial financial challenges imposed by an ageing population may limit insurance penetration. However, economic progress, regulatory changes, and financial literacy programs help alter the perspective of insurance from a luxury to a requirement for managing age-related risks.

The study's findings are consistent with this pattern, highlighting the intricate interaction between old-age reliance and insurance penetration throughout different time periods. This dynamic underscore the greater requirement for adaptable financial institutions to handle shifting demographic realities, particularly in regions with changing age structures and economic development.

GDP

The study's findings show that the link between GDP and insurance penetration swings from positive in the short run to negative in the near long and long run. This development demonstrates the intricate connection between economic growth and insurance demand throughout various periods.

In the short run, the positive association implies that economic growth leads to increased insurance penetration. As GDP increases, families and companies gain more disposable income and financial stability, allowing for more access to insurance products. This is consistent with the results of scholars such as Alhassan and Biekpe

(2016) and Beck and Webb (2003), who argue that economic growth promotes demand for insurance by increasing affordability and raising knowledge about risk reduction. In many emerging economies, this early stage of growth is generally accompanied by an increase in insurance literacy and the adoption of insurance as a financial planning tool.

However, the connection shifts with time. This trend might be related to market saturation and the declining marginal usefulness of insurance as economies develop. As GDP rises, people and organizations may become more reliant on alternative risk management measures such as investments, savings, or self-insurance, reducing the demand for formal insurance. Furthermore, in certain circumstances, economic progress promotes better financial stability and resilience, lowering the perceived need for insurance. This finding is consistent with research by Dragos (2014) and others, who found that in some situations, rapid GDP development might lead to a drop in insurance penetration due to these dynamics.

Cultural and structural variables in developing countries may also play a role in the negative association over time. For example, dependence on communal safety nets or informal risk-sharing mechanisms may remain even when GDP rises, especially in areas where traditional institutions are well established. Furthermore, even with overall GDP growth, unequal distribution of economic gains might hinder insurance accessibility for lower-income groups.

The results are consistent with this trajectory, demonstrating how GDP's impact on insurance penetration changes over time. While short-term economic growth boosts insurance demand, the near- and long-term consequences highlight the significance of tackling market saturation, income inequality, and alternative risk management strategies to sustain and extend insurance penetration. This intricate relationship underlines the importance of targeted regulatory actions and new insurance solutions in ensuring the sector's continuing expansion in the face of shifting economic conditions.

Income levels

The results show that the relationship between income per capita and insurance penetration is positive in the short and near-long run, but negative in the long term. This pattern demonstrates the long-term dynamic influence of income on insurance demand, as well as larger economic and socio-cultural shifts.

Rising income levels, both short and near-long-term, often lead to increasing insurance uptake. Individuals with more income per capita may better pay insurance rates, which increases demand for insurance goods. This positive association is consistent with earlier research, including studies by Beck and Webb (2003) and Alhassan and Biekpe (2016), which discovered that increased income promotes higher insurance usage by making it more financially available. In developing nations, rising income levels may promote a greater understanding of the importance of financial protection, such as life or health insurance, as people begin to prioritize risk reduction and asset preservation.

However, in the long run, the relationship becomes negative. A variety of causes may have contributed to this transition. As income levels grow, consumers may prefer alternative wealth management or risk-sharing methods over traditional insurance policies. People with higher incomes may have more access to self-insurance choices, investment possibilities, or informal risk-sharing agreements, reducing their need for formal insurance. Furthermore, when people's wealth grows, their perceived need for insurance may decrease, particularly if they believe their financial condition is solid enough to handle hazards on their own.

This long-term negative association may also be explained by the idea of "**insurance saturation**." As a population's wealth grows, the initial demand for insurance products may peak, and future income growth may not result in an equivalent rise in insurance penetration. This is consistent with the findings of research such as Zerriaa et al. (2017), who found that in high-income contexts, the marginal value of insurance decreases over time. Furthermore, economic disparity within a nation may increase this impact, with richer people more inclined to avoid insurance or switch to other risk management measures, while lower-income groups are still excluded from insurance markets owing to price limits.

Thus, the findings are consistent with this broader understanding, demonstrating that, while income per capita positively influences insurance penetration in the short and near-long run, it can have a diminishing or even negative impact in the long run as individuals and societies shift to different financial strategies and face insurance market saturation. This dynamic emphasizes the significance of addressing both economic inequality and the changing nature of risk management to sustain and extend insurance coverage throughout time.

Finally, a negative and significant error correction term further confirms a long-term relationship. And a CUSUM test to check that the model is stable, lending credibility to the study's results.

5.3 Limitations of the study

1. Cultural and Socioeconomic Differences

The study focused mostly on African countries, and while it covers a wide variety of countries, it may not completely account for the subtle variances in cultural, social, and institutional aspects that impact insurance demand. Cultural ideas concerning insurance, such as perceptions of risk and faith in financial institutions, are particularly important yet difficult to assess consistently across nations. Informal or community-based risk-sharing activities (for example, rotating savings and credit groups) may not be completely recorded in the data, but they can have a significant impact on formal insurance uptake.

2. Limited Data Availability

One of the study's primary limitations is the lack of reliable data for particular countries of interest. For example, for several countries, data on critical variables like insurance penetration, economic indicators, and demographic parameters are either missing or inconsistently recorded over the research period. This makes it difficult to draw reliable conclusions about these countries, particularly when conducting time-series analysis. As a result, particular countries were eliminated from the research and others may be under-represented, limiting the scope of the findings.

3. Data Gaps for Certain Variables

In addition to gaps in certain countries' data, certain variables might be under-reported or missing. This contains more specific information on aspects such as insurance literacy, cultural effects, and informal risk-sharing methods common in some locations, notably Africa. These factors may be important in understanding the dynamics of insurance uptake and penetration, but without enough data, they cannot be properly included in the research.

4. **Limited Progressive Scope**

Another issue is the study's temporal span. While the study examines quarterly data from 2008 to 2022, the relatively short timeframe may fail to account for longer-term economic or demographic developments that might impact insurance use. Certain macroeconomic shocks, political developments, or sociological shifts that happened outside of this time frame may have influenced the interpretation of the results. Furthermore, the COVID-19 epidemic and its aftermath may have momentarily affected economic metrics like income levels or inflation rates, which may not be properly reflected by the research.

5. **Generalizability of Results**

Finally, while the study intends to examine a range of African countries, the conclusions may not be easily applied to countries outside of the continent. Africa has distinct institutional, economic, and cultural dynamics that may differ dramatically from other areas, such as Asia or Latin America. Thus, while the findings of this study are important to the African setting, they should be regarded with caution when applied to other regions of the world.

5.4 Recommendations

Some recommendations for future research

- Future studies might include single-country case studies to better understand the economic, social, and cultural dynamics of every country. This technique would allow for a more in-depth examination of how factors impact insurance penetration and demand in individual countries, rather than generalized findings. For example, comparing a nation with high insurance penetration, such as South Africa, to one with low penetration, such as Nigeria, might provide valuable insights into the mechanisms behind the differences.

- Incorporating additional African countries into future studies would give a more comprehensive knowledge of insurance rates across various circumstances. This would allow for a more extensive regional examination as well as improved identification of trends or patterns that may be unique to various

African areas. Efforts should be made to gather data from under-represented nations due to data limitations.

- Future research could examine adding factors such as the Gini Index, which measures income inequality, to better understand how income distribution influences insurance demand. While a high per capita income may signal that insurance is more affordable, especially in the short run, income disparities can hinder penetration if wealth is concentrated in a small portion of society. Additionally, socioeconomic variables such as health spending, and unemployment rates may also give further insight into the link between socioeconomic characteristics and insurance penetration

- Cultural factors like confidence in financial institutions, risk attitudes, and dependence on informal social safety nets could influence insurance demand. Future studies might investigate these qualities using qualitative approaches or quantitative indicators such as Hofstede's cultural dimensions, which assess individualism, uncertainty avoidance, and power distance.

- The importance of financial technology (FinTech) and digital platforms in facilitating access to insurance products is growing across Africa. Future research could look into how technology-driven solutions, such as mobile money and digital insurance platforms, affect insurance penetration, especially among previously marginalized communities.

- Finally, I would recommend strengthening data collecting and reporting standards, researchers may consider forming collaborations with local governments, regional organizations, and international institutions. Collaboration with organizations such as the African Development Bank and the International Monetary Fund might provide access to more trustworthy and standardized datasets across borders.

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