Determinants of Life Insurance Penetration in SADC

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DEDICATION

This dissertation is dedicated to my parents, who out of nothing gave me plenty of prospects in life, and a fortified spirit to amass my knowledge through education. I will forever be grateful for all you gave me. I also dedicate the dissertation to my son, who forever keeps a smile on my face; I love you so much.

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ABSTRACT

This study aims to investigate variables that impact on life insurance consumption in 15 Southern African Development Community member states, using panel data for the period 1995 to 2013. The macroeconomic and demographic variables employed in the research are income, inflation, financial development, urbanisation, education, health expenditure, age dependency, life expectancy, institutional quality (independent variables), and life insurance penetration (dependent variable) in Southern African Development Community member states. The study employed the fixed effects and system general methods of moments techniques to estimate the panel data. From the findings, it is concluded that the demand for life insurance varies for each model. Generally, fixed effects estimations reveal different outcomes for each model; variables such as inflation, health expenditure, age dependency, and voice accountability, are significant in explaining life insurance consumption in the Southern African Development Community region. The system general methods of moments estimator results uncover different outcomes: variables such as lag of life insurance penetration, health expenditure, age dependency, corruption control, and regulatory quality, are significant in explaining life insurance consumption. In general, the study concludes that there are positive/negative and significant/non-significant relationships amongst variables for demand of life insurance. The study then makes policy recommendations, that Southern African Development Community countries should advance the variables that influence the demand for life insurance, and that policies for the protection of life insurance growth should be developed to grow a healthy insurance sector.

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GLOSSARY

CISNA: Committee of Insurance, Securities and Non-Banking Financial Authorities

CPI: Consumer Price Index

FSB: Financial Services Board

GPW: Gross Premiums Written

OECD: Organisation for Economic Co-operation and Development

SADC: Southern African Development Community

TIFI: Trade, Industry, Finance and Investment Directorate

Chapter 1:

Introduction

1.1 Background of the study

Life risk factors, coupled with the element of uncertainty, will always be inevitable. People are therefore, exposed to many risks that can hamper their dreams. These risks, amongst others, include financial distress and disasters. The Southern African Development Community (SADC) has an estimated population of 277 million, and the majority of this region's citizens depend on government-sponsored financial support programmes, due to the brunt of financial burdens that affect people in the region. The life insurance market has not fully developed in this region, except in the case of members states South Africa and Mauritius.

In the face of increasing financial development, urbanisation, and tertiary education attainment, life insurance has become important as a form of savings that safeguards families against financial shocks. The aids of life insurance are vital, as people around the globe regularly require financial security; therefore, purchasing a life insurance policy has the potential to secure adequate savings for the future. A life insurance policy can be defined as a designed contract or agreement between a policyholder and an underwriter, whereby the underwriter agrees, in advance, to pay a policyholder in the event of death during the period covered.

One benefit of a life insurance policy is that it provides necessary financial support to families, and as such it has proven to be a positive tool that instils a culture of saving. Purchasing life insurance protects families against unexpected financial encounters that result from death, and provides families with the wisdom of monetary confidence. From a statistical point of view, purchasing a life policy can be classified as a mathematical-probability. This can arise in two ways: an individual can pay the policy premium required and fall short of getting anything in return while, on the other hand, an individual who buys the policy can benefit from the insurance payout. This mathematics of insurance falls under the probability theory (Koller, 2012).

The development of life insurance can contribute immensely to economic progress through savings enlistment, as well as its intermediary approach to financial markets

and the economy. This instrument has the potential to guarantee that capital is provided to elements that require investments for financial necessities, as well as to investments in expertise that can lead to production maximisation.

A healthy insurance industry can stimulate economic growth and development. According to Insurance Europe (2015), the advantages of developing the insurance sector are that:

- The insurance sector simplifies business and economic transactions through transfer of risk and indemnification;
- It drives risk management and the advancement of safe practices; and
- It provides long-term investment and financial stability in the economy, and inspires firm and workable reserves and pension establishment.

The research conducted for this dissertation will observe the demand for life insurance in SADC member states, and identify key variables that influence insurance consumption. The examination will deliberate on demographic and economic variables, such as income, Consumer Price Index/inflation (CPI), financial development, urbanisation, tertiary education attainment, health expenditure, age dependency, life expectancy, and institutional quality, to determine how they influence life insurance consumption in SADC countries. Institutional quality variables include the following: control of corruption, government effectiveness, political stability, regulatory quality, rule of law, and voice accountability.

Motivation for the research derives from the determined regional economic integration of the SADC region, and to examine key drivers of the life insurance market and how they can be developed to contribute to the region's financial markets. The average percentage for life insurance penetration in the region for the period 1995 to 2013 is 22,35%, with South Africa accounting for 11,48% of the total percentage average, followed by Namibia at 4,39%, and Mauritius at 2,75%.

1.2 Problem definition

The determinants of life insurance, its economic returns arising from a healthy life insurance sector, and its positive relations to economic growth, have become the focuses of better-quality studies. The Committee for Insurance, Securities and Non-

Banking Financial Authorities (CISNA) was created by the SADC Secretariat in 1998. It resides within the SADC Directorate of Trade, Industry, Finance and Investment (TIFI), which is responsible for harmonising trade and financial liberalisation (SADC, 2015). CISNA comprises of non-banking financial institution authorities such as capital markets, collective investment schemes, insurance companies, retirement funds, and providers of intermediary services (Committee for Insurance, Securities and Non-Banking Financial Authorities [CISNA], 2014).

The Financial Service Board (FSB) in South Africa currently hosts the CISNA Secretariat; the permanent Secretariat was to be established by 2017. As per CISNA's 2015 annual report, around 431 insurance companies received approval to conduct insurance business in the SADC region, as opposed to 398 companies in 2014 (CISNA, 2014). This represents an increase of 33 companies in the region, year on year. The biggest market shares of 41% and 8% are claimed by South Africa and Zimbabwe respectively.

Despite the heightened enquiries in the study of the insurance sector, there is a dearth of experiential studies that focus on emerging economies such as the SADC region. The majority of the theoretical enquiries and examinations on the demand for life insurance have centred on individual developed countries, or have been advanced through continent-wide enquiries. Lesser attention is given to emerging economies when identifying factors that dissuade development of life insurance markets. This research undertakes to examine the drivers of life insurance consumption and to identify variables that influence life insurance demand.

Lessons can be drawn for less developed countries when distinguishing variables that contribute to life insurance consumption, and how to improve those variables to develop an insurance industry that will spur economic development. There are advantages to developing a vibrant insurance sector.

1.3 Research objectives and hypotheses

1.3.1 General objective

The general objective of this study is to examine the variables that influence life insurance demand in SADC countries.

1.3.2 Specific objectives

The specific objectives of this study are to evaluate the development of life insurance markets among SADC countries, to identify each member state's life insurance penetration rate, and to investigate how carefully chosen demographic and macroeconomic factors stimulate the growth of life insurance markets within the region.

1.3.3 Research hypotheses

Hypothesis 1: A positive and significant relationship between income levels and life insurance demand is expected.

Hypothesis 2: A negative relationship between inflation and the demand for life insurance is expected.

Hypothesis 3: A positive and significant relationship between financial development and life insurance demand is assumed.

Hypothesis 4: There is a positive and significant relationship between urbanisation and life insurance demand.

Hypothesis 5: There is a positive and significant relationship between a higher level of education and life insurance consumption.

Hypothesis 6: There is a negative relationship between health expenditure and the demand for life insurance.

Hypothesis 7: There is a positive relationship between age dependency and the demand for life insurance.

Hypothesis 8: There is a negative relationship between life expectancy and the demand for life insurance.

Hypothesis 9: There is a positive relationship between institutional quality and the demand for life insurance.

1.4 Study justification

The research determination of this study is to provide information on estimates of life insurance penetration patterns in the SADC region. Insurance-sector markets can employ the results of this study to better develop their marketing approaches, and to refine their products based on each member state's needs and desires.

The research will undertake to make policy recommendations on predictive variables of the life insurance sector to attain a viable, healthy industry. The enquiry hopes to enhance life insurance documentation in the region. It is envisaged that the study findings will improve on the current literature on life insurance, and will serve as a source of further examination in the field of life insurance. The research can contribute expertise to specialists, insurance industries, governments, and academics, as factual presentation of SADC life insurance.

1.5 Dissertation structure

Chapter 1 presents the framework of the preliminary chapter, which contains the synopsis of the research context and explains the problem statement.

Chapter 2 contains the literature review, which provides the foundation for developing a theoretical framework and acknowledges relevant current and past empirical research that has been conducted in the sphere of the research topic.

Chapter 3 delivers an overview of the research methodology used in this study.

Chapter 4 presents the data analysis, which demonstrates patterns of outcomes of the descriptive analysis.

Chapter 5 contains the conclusion that has been drawn from the research, which entails succinct deductions on the findings of the study. It further presents policy advice for the SADC region and makes recommendations for future enquiries.

Chapter 2:

Literature review

2.1 Introduction

Academic and experimental interpretation will be outlined in this chapter on life insurance demand, in addition to an outline of life insurance markets in the SADC region. It covers the characteristics of the life insurance market in each member state, the focus being on life gross premiums' relationship to gross domestic product (GDP). The failure to administrate data collection on insurance penetration in some parts of the SADC region has been detrimental to the development of this sector.

2.2 Life insurance

A life insurance policy is a secure arrangement and affordable method for creating a financial facility for a family. Benjamin Franklin created fire insurance in 1752, often referred to as the father insurance, he extended provide insurance on crops, life insurance and insurance for widows and orphans (Thomas & McSharry, 2015). "Life insurance is the cheapest and safest mode of making certain prvions for one family[1]"

The African continent has an abundance of natural resources, which in turn require massive infrastructure-investment programmes. There is an ever-expanding middle class and, with a young and growing population, the SADC region's population is expected to increase by 4% per annum from 2016 to 2020 (Africa Reinsurance Pulse, 2016). The expected population growth and rapid urbanisation of the region will certainly drive the demand for insurance. An insurance industry enables investment, as it diminishes the volume of money that businesses and individuals are required to have at hand, thus facilitating the increase of financial market development and the growth of a culture of saving.

[1] Benjamin Franklin, 1769.

The development of life insurance can be traced as far back as 1809, when eminent businessmen decided to create the first for-profit life insurance company in the United States of America (Murphy, 2010). In 1814, life insurance was not popular and was instead associated with gambling, murder, or fraud. Murphy (2010) further provides a definition of insurance on a life as a contract whereby premiums of a certain percentage are paid on condition that, should the person named die before a specified time, his or her heirs should receive the amount of the principal for which the premium was paid.

Life insurance offers developing countries such as those in the SADC region an opportunity to mobilise domestic savings for the long term. Investing in life insurance has been touted as a valuable safety net for the emergent middle class. Life insurance spurs financial and economic growth (Sibindi, 2014), and what most SADC countries lack is efficient and vibrant financial development.

Life insurance development can assist economic improvement and the growth of financial markets in any given economy. It guarantees to pay the agreed sum to a household in the event of the policyholder's death and provides financial security to a distressed family after the premature demise of a wage earner. Life insurance payouts can also serve as a tool whereby individuals save money. It enjoys favourable tax treatment, as death benefits are generally tax-free for the beneficiaries. Life insurance also serves as collateral in appointing the lender as the beneficiary of a death benefit when securing a loan. If the borrower fails the obligation to repay the loan, the lender can cash in the policy to recover what he is owed.

The Organisation for Economic Co-operation and Development (OECD) (n.d) Secretariat report observed that life insurance eases the burden of social spending on governments; therefore, governments can focus on core social benefits. The life insurance industry also serves as a financial intermediary between investors and economic agents. The insurance companies in OECD countries are the largest institutional investors. The gross value of insurance premiums, which is called the penetration ratio – the percentage of GDP – is usually used to measure the extent of a country's insurance market.

Africa Reinsurance Pulse (2016) states that African life insurance totalled US$43,7 billion, double the amount of the non-life insurance market of US$20,4 billion. The top

life insurance country is South Africa (US$37,5 billion) with a leading stake of 86%, tailed by Morocco (US$1,1 billion), Egypt (US$1 billion), Kenya (US$0,7 billion) and Namibia (US$0,6 billion) Africa Reinsurance Pulse (2016). Other SADC countries that made the top 10 list include Zimbabwe and Botswana.

However, African life insurance penetration remains low. The challenges that explain the low demand for insurance in Africa, according to KPMG (2015) include:

- Low awareness and understanding of insurance across various populations;
- People do not trust financial services providers;
- A lack of reliable information, which makes it difficult to assess people's risk;
- Poor legal and judicial systems;
- Lack of human-capital expertise;
- Shallow financial markets that make it difficult to raise enough money to capitalise insurance companies; and
- Communities often make use of informal forms of insurance, rather than using the services of formal insurers.

Notwithstanding their benefits to economic development, most African countries still experience an absence of insurance products. Given the challenges of African countries as they struggle to meet their basic food supply targets, insurance remains a dream. But, for middle-income brackets, insurance uptake is starting to increase.

2.3 Overview of life insurance markets in the Southern African Development Community

The life insurance gross premiums written (GPW) in the SADC region totalled US$41,539 million in 2012 (CISNA, 2012). In 2014, it amounted to US$37,833 million, representing a decline of 9% from 2012. The biggest portion of the life insurance market ,with GPW of US$35,828 million in 2014, was held by South Africa, while in 2012 it stood at US$39,499 million (CISNA, 2014). Overall, assets in insurers' possession as of December 2015 totalled US$203,012 million, which represents a decline when compared to US$228,789 million at the end of 2014. Underwriters' liabilities decreased by 15,6% to US$175,568 million, compared to US$208,040 million in 2014. The insurers' assets were US$27,444 million at the end of 2015, showing an

improvement of 32,3% compared to US$20,748 million at the end of 2014 (CISNA, 2014).

Table 2.1 presents a distribution of aggregate total assets, liabilities and net worth of all insurance companies in the SADC region[2] for the period ending December 2012. It is observed that the non-life insurance companies in South Africa account for two thirds (67,1%) of non-life business assets across the SADC region, while the life business accounts for more than 94,1% of life business assets of life business. This suggests that life and non-life insurance markets are dominated by insurance companies. The annual GPW of SADC countries is presented in Figure 2.1.

The figure illustrates the contraction of SADC life insurance GPW for the period 2011 to 2015. South Africa has a considerable amount of life insurance market in the total asset market, followed by Namibia, and Mauritius. Figure 2.1 also indicates that life insurance premiums within the region have been decreasing in value over the years. The drop in life insurance premiums could be influenced by the policy inconsistencies that hamper the development of this market in the region. The highest GPW was recorded for the period of 2012 and declined until 2015.

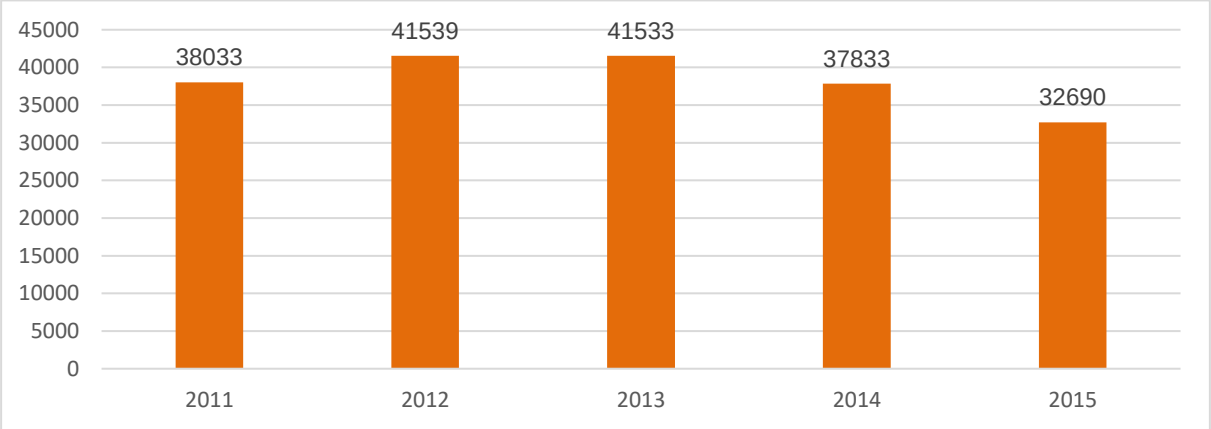
[2] Table 2.1 excludes the Democratic Republic of Congo and Madagascar.

Table 2.1: Assets, liabilities, and capital of insurance companies in the SADC region

	Total assets		Total liabilities		Capital and reserves	
	Non-life	**Life**	**Non-life**	**Life**	**Non-life**	**Life**
Angola	12,8%	-	18,4%	-	3,7%	-
Botswana	1,1%	0,9%	1,0%	0,9%	1,3%	1,0%
Lesotho	0,2%	0,2%	0,2%	0,2%	0,2%	0,3%
Malawi	0,3%	0,2%	0,3%	0,2%	0,3%	0,2%
Mauritius	6,9%	1,6%	2,8%	1,7%	13.5%	0,9%
Mozambique	4,2%	0,3%	4,7%	0,2%	3,2%	0,7%
Namibia	2,7%	1,7%	3,1%	1,6%	2,1%	2,0%
Seychelles	0,2%	0,0%	0,0%	0,0%	0,4%	0,2%
South Africa	67,1%	94,1%	64,6%	94,3%	71,1%	93,2%
Swaziland	0,3%	0,1%	0,3%	0,1%	0,3%	0,1%
Tanzania	2,0%	0,0%	2,0%	0,0%	2,0%	0,1%
Zambia	0,8%	0,1%	1,2%	0,0%	0,3%	0,1%
Zimbabwe	1,4%	0,8%	1,2%	0,8%	1,6%	1,2%

Note: Assets, liabilities and capital data from CISNA annual report (2015).

Figure 2.1: SADC gross life premium figures (US$ million)



Note: Yearly GPW (life insurance) for SADC region data from CISNA annual reports (2012, 2013, 2014, 2015).

2.3.1 Characteristics of life insurance in each member state

Angola

Angola's insurance market remains small and accounted for 1,25% of the country's GDP by 2012. As of 2010, 10 firms overall were already established and five more were in the process of being licensed (Barros & Wanke, 2016). The overall insurance

market is 90% non-life. The Angolan insurance industry was restricted to a state monopoly called Empresa Nacional de Seguros de Angola (ENSA) until 2000 (eBiz Guides, 2008). A South African insurance company saw a gap to enter the insurance market in Angola and Mozambique, and it operates under the name Global Alliance Seguros Angola.

Angola has low life insurance penetration, demonstrating the failure by government and the insurance industry to provide public awareness regarding saving and investment products in the life insurance segment.

The Institute of Insurance Supervision (ISS), which operates under the Ministry of Finance, supervises and regulates the Angolan insurance industry. Angola's stable economic growth and favourable regulatory framework yield a potential market for life insurance. The development of the economy, infrastructure investment, life expectancy, and awareness among consumers, are possibly the key drivers of the demand for life insurance in the country.

Table 2.2: Stylised facts on the life insurance market in Angola

	2005	**2013**
Life insurance GPW	US$17,31 million	US$16,90 million
Penetration rate	-	-
Life penetration rate	0,056%	0,0132%
Number of life firms	1	1
Minimum capital	US$10 million	US$10 million
Number of business lines	2	2

Note. Data for life insurance market facts from Swiss Re-Sigma (2014), CISNA (2015), African Development Bank Group (2016), Africa Reinsurance Pulse (2016) and Africa Re, (2015).

Botswana

Botswana's insurance sector is supervised and administered by the Non-Bank Financial Institutions Regulatory Authority (NBFIRA). During 2016, the number of life insurance companies operating in the country had increased to 9 from 8 in 2013, while the number of insurance brokers increased to 46 from 40 in 2013; during the same period, six insurance brokerage licences where issued and three insurance brokers withdrew their licences (NBFIRA, 2016).

The life insurance sector remains strong and its total assets exceed the total liabilities by P2,8 billion. Life insurance has continued to dominate the insurance sector in terms of the market share, both in terms of GPW and total assets (NBFIRA, 2016).

Table 2.3: Stylised facts on the life insurance market in Botswana

	2011	**2013**
Life insurance GPW	US$313,36 million	US$325 million
Penetration rate	-	3,3%
Life penetration rate	2,04%	2,06%
Number of life firms	7	8
Minimum capital	US$100 million	US$100 million-US$500 million
Number of business lines	6	6

Note. Data for life insurance market facts from NBFIRA Annual Report (2012, 2013), African Development Bank Group (2016), Africa Reinsurance Pulse (2015), and Swiss Re-Sigma (2014).

Democratic Republic of Congo

The lack of liberalisation of the insurance sector in the Democratic Republic of Congo (DRC) has impeded the growth of this sector. The government's monopoly of the insurance sector dates back to 1967. Société Nationale d'Assurance (SONAs) is the sole public non-life insurance company operating in the country (International Monetary Fund [IMF], 2014).

The DRC Insurance Code Law, which came into effect on 14 January 2015, ended the state monopoly with a 12-month moratorium period, giving government time to set up the regulatory authority, Autorité de Régulation et de Contrôle des Assurances (ARCA). The insurance is poorly developed, with a penetration rate of 0,4%, which amounts to a quarter of the penetration rate of most neighbouring countries (EY, 2016).

Table 2.4: Stylised facts on the life insurance market in the DRC

	2000**	**2005****
Life insurance GPW	-	US$0,26065 million
Penetration rate	-	0,3%
Life penetration rate	0,000661%	0,002781%
Number of life firms	1	1
Minimum capital	US$10 million	US$10 million
Number of business lines	2	2

Note. Data for life insurance market facts from Swiss Re Sigma (2014), IMF (2014), African Development Bank Group (2016), and Africa Reinsurance Pulse (2015). **Only the years provided in Table 2.4 had the available data required to present the DRC life market.

One of the challenges affecting the development of the insurance market in Africa is the failure to administer financial data. DRC insurance market data is hardly available, as opposed to other SADC countries. The CISNA List of Authorities registers the Financial and Economic Attaché (Diplomat) in the embassy, not a financial institution, as the person who must provide financial data to the CISNA Secretariat. The current political situation in DRC might also be a cause of instability in the insurance market.

Lesotho

The Lesotho insurance industry is monitored by the Insurance Supervision Department of the Central Bank of Lesotho and is regulated by the Central Bank, which issues licences and receives financial statements (Central Bank of Lesotho [CBL], 2007). For the year ending 2007, general and life insurance business gross payments increased by 26%, from M421,3 million in 2006 to M569,2 million in 2007 (CBL, 2007). Life insurance premiums in Lesotho have substantially improved from 2010 to 2017; this demonstrates the growth of life insurance demand in that country. It is evident that the people of Lesotho are purchasing life insurance at an increased rate.

Table 2.5: Stylised facts on the life insurance market in Lesotho

	2005	**2012**
Life insurance GPW	US$39,54 million	-
Penetration rate	-	4,5%
Life penetration rate	3,02%	3,27%
Number of life firms	3	3
Minimum capital	US$6,500 million	US$6,500 million
Number of business lines	6	7

Note. Data for life insurance market facts from Swiss Re Sigma (2014), and CBL (2007), African Development Bank Group (2016), and Africa Reinsurance Pulse (2015).

Madagascar

The insurance market in Madagascar is in its initial phase of progress and accounts for the remainder of the domestic financial system. The low income per capita in the country for the general population impacts on the life insurance penetration rate, which is lower than 1% of the population (IMF, 2015). The insurance companies are overseen by the Ministry of Finance and Budget (MFB), which also owns the largest undertaking, leading to a conflict of interest (IMF, 2016).

The country currently has three public and two private insurance companies. The International Monetary Fund (IMF) has pinpointed key constraints affecting insurance-industry growth in Madagascar (IMF, 2015), namely:

- Lack of data on the insurance market;
- Asset shortages; and
- Difficulty of investing in premiums beyond real estate and government for lack of invisible assets, which in turn creates concentration risk in a portfolio.

Table 2.6: Stylised facts on the life insurance market in Madagascar

	2005	**2012**
Life insurance GPW	US$3,94 million	US$14,21 million
Penetration rate	-	0,6%
Life penetration rate	0,085%	0,143%
Number of life firms	-	-
Minimum capital	MAG600 million-MAG1 billion	MAG600 million-MAG1 billion
Number of business lines	5	5

Note. Data for life insurance market facts from IMF (2015), Swiss Re Sigma (2014), African Development Bank Group (2016), and Africa Reinsurance Pulse (2015).

Malawi

The economic challenges facing Malawi make insurance a luxury that rarely forms part of a household budget, as the majority of the population lives below the poverty line. Here, insurance penetration is the lowest in the world, with an average rate of 2,8% to 3,5% (Kamzingeni-Zulu, 2016). Despite these economic challenges, the life insurance market registered 36% growth in GPW of MWK10,2 billion in 2014, as compared to MWK7,5 billion in 2013 (Reserve Bank of Malawi [RBM], 2014).

The size of the life insurance market was reported to have shown some level of growth due to the entry of the Cooperative Life Insurance in 2015, despite the growth concentration risk challenge arising from the dominance of two market players (RBM, 2016). In September 2015, the total capital for the life insurance sector was MWK22,1 billion, which remained unchanged until March 2016.

Table 2.7: Stylised facts on the life-insurance market in Malawi

	2005	2013
Life insurance GPW	-	US$20.32 million
Penetration rate	1,13%	1,3%
Life penetration rate	0,155	0,388
Number of life firms	3	2
Minimum capital	MWK50 million	MWK50 million-MWK100 million
Number of business lines	-	-

Note. Data for life insurance market facts from RBM (2012), Swiss Re Sigma (2013), African Development Bank Group (2016), Africa Reinsurance Pulse (2015), and The World Bank (2008).

Mauritius

The Financial Services Commission (FSC) regulates, monitors and supervises the insurance and pension sectors in Mauritius. In 2015, there were 14 registered insurance companies, the biggest life insurance company being British American Investment Company (BAIC) with a market stake of 43,5%, which was placed under special administration (Aumeer, Sainooah-Murdan, & Rughoobur, 2015). The insurance market in the country is well developed, with a higher penetration rate that is in equal ranking with countries such as Chile, Cyprus, and Singapore, and higher than India, Lebanon, Sri Lanka, and Morocco (Sigma, 2002).

Elaborating on the development of this sector as of 2011: the total premiums equalled MUR5,3 billion – equivalent to 4,1% of the GDP (Vittas, 2003). The leading insurance demand is life insurance, which accounts for 61% of the total premiums. The United Nations Conference for Trade and Development (UNCTAD, 2007) posits that one fundamental aspect that led to the growth of the insurance industry in Mauritius is that the industry is mainly operated by the private sector. Vittas (2003) also pointed out that the macroeconomic climate, through regulations and systems in the country, provides for the sector to flourish.

Table 2.8: Stylised facts on the life insurance market in Mauritius

	2005	**2013**
Life insurance GPW	US$195,72 million	US$489,23 million
Penetration rate	-	5,8%
Life penetration rate	3%	4,10%
Number of life firms	-	7
Minimum capital	-	MUR25 million
Number of business lines	-	5

Note. Data for life insurance market facts from Swiss Re Sigma (2014), FSC (2015), AIO (2016), African Development Bank Group (2016), Africa Reinsurance Pulse (2015), and Aumeer et al. (2015).

Mozambique

The Institute of Insurance Supervision of Mozambique (ISSM) is an entity within the Ministry of Finance and its functions cover insurance activities, insurance mediation and reinsurance, and management of the pension fund (World Bank Group, 2015). The Institute of Insurance Supervision of Mozambique (ISSM, 2015) reported an increase of 10,1% in the insurance market in 2014. The gross premium charged by insurance companies amounted to US$116 million in 2015, resulting in an insurance penetration rate of 1,58% (ISSM, 2015).

The main type of insurance taken out in the country is non-life insurance. However, its growth rate declined in 2015 to 81,9% as compared to the period of 2014, when it stood at 86%. The life insurance sector increased its growth in 2015 to 18,1%, as compared to the previous year when it stood at 14% (ISSM, 2015).

Table 2.9: Stylised facts on the life insurance market in Mozambique

	2005	**2013**
Life insurance GPWs	US$6,86 million	US$31,24 million
Penetration rate	-	1,3%
Life penetration rate	0.,03%	0,204%
Number of life firms	1	4
Minimum capital	MZN33 million- MZN 67 million	MZN33 million-MZN67 million
Number of business lines	4	-

Note. Data for life insurance market facts from Swiss Re Sigma (2014), African Development Bank Group (2016), and Africa Reinsurance Pulse (2015).

Namibia

The Namibia Financial Institutions Supervisory Authority (NAMFISA) is an entity that regulates and supervises financial institutions in the financial services industry, including insurance, retirement funds, and the financial market. As of June 2016, the long-term insurance industry comprised of 16 insurers, one reinsurer, and two reinsurance brokers, with the total assets recorded in the period being N$47 billion, compared to N$45 billion in 2015 (Namibia Financial Institutions Supervisory Authority [NAMFISA], 2016).

According to the short-term insurance industry's financial records, its total assets grew on a quarterly basis from N$5.6 billion to N$6 billion due to an increase in technical assets. The life insurance sector is privately run, and as of 2008, it comprised of 16 long-term insurers and 12 short-term insurers (IMF, 2008).

Table 2:10: Stylised facts on the life insurance market in Namibia

	2005	**2013**
Life insurance GPW	US$399,63119 million	US$661,97592 million
Penetration rate	-	7,7%
Life penetration rate	5.5%	5,04%
Number of life firms	3	
Minimum capital	N$1 million	N$1million-N$4 million
Number of business lines	6	6

Note. Data for life insurance market facts from Swiss Re Sigma (2013, 2015), NAMFISA (2007, 2013, 2014), African Development Bank Group (2016), Africa Reinsurance Pulse (2015), and the Long-term Insurance Act, 1998-2011.

Seychelles

In July 2013, the Central Bank of Seychelles ceased to administer the insurance sector, which was then transferred to the Financial Services Authority (FSA). As of 2015, the country had 11 licensed insurance companies, as compared to 10 companies in the previous year, five companies were operating domestically, while six were operating as non-domestic insurance companies (Financial Services Authority [FSA], 2015).

The most accessed insurance product in the country is household insurance at around 20%, then motor vehicle insurance at 17%, while life insurance remains very small in the country with an average of 16% (Naidoo & Motsomi, 2016).

Table 2.11: Stylised facts on the life insurance market in Seychelles

	2005	**2012**
Life insurance GPW	-	US$685,83 million
Penetration rate	-	2,3%
Life penetration rate	0,71%	0,34%
Number of life firms	-	6
Minimum capital	-	US$100 000
Number of business lines	-	-

Note. Data for life insurance market facts from Swiss Re Sigma (2014), AIO (2016), Association of Kenya Insurers (AKI, 2013), African Development Bank Group (2016), and Africa Reinsurance Pulse (2015).

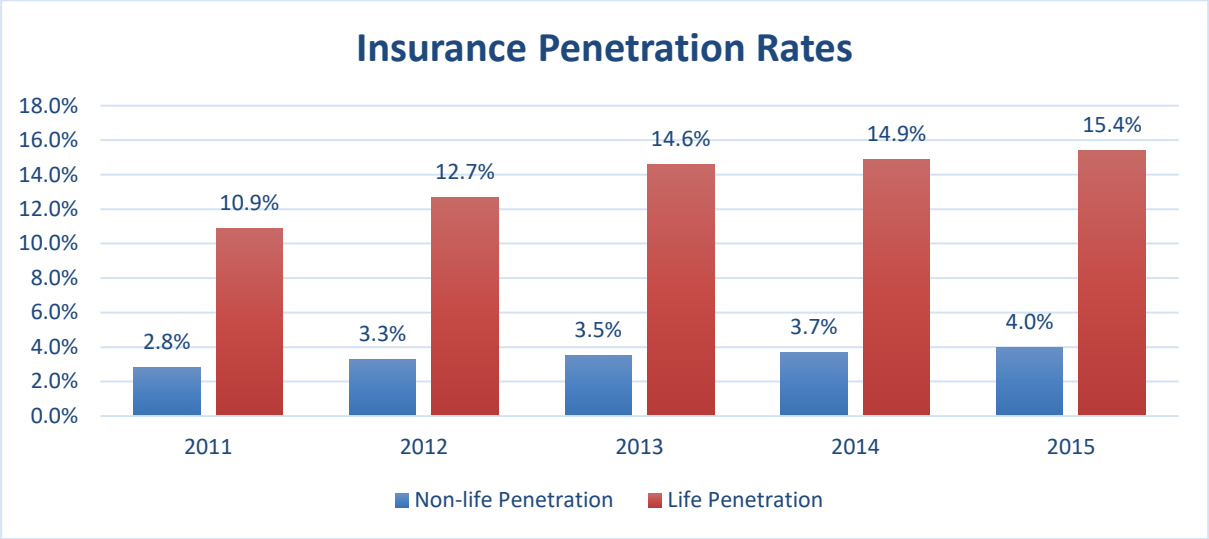
South Africa

In South Africa, the insurance division of the Financial Services Board (FSB)[3] is responsible for supervising and enforcing the Long-Term and Short-Term Insurance Acts of 1998. The country had 82 licensed long-term insurance companies by 2015. South Africa's insurance premiums accounted for 80% of the insurance market in Sub-Saharan Africa, and the country had the highest global penetration of life insurance from 1990 until 2006 (Condon & Sinha, 2008). As a middle-income country, South Africa's insurance penetration is highly concentrated at 14%. By way of comparison, from 1996 to 2006, the United Kingdom had a 10% life insurance penetration, while Japan had 9% (Condon & Sinha, 2008).

In 2013, South Africa's grading was at 15 for long-term and 28 for short-term insurance markets (Sigma, 2013). Africa's total insurance premiums in 2013 were worth US$72,4 billion, of which South Africa's insurance premiums accounted for US$54 billion, reflecting the big market share of the South African insurance industry.

[3] FSB currently hosts CISNA.

Figure 2.2: Insurance penetration rates



Data from FSB quarterly reports (2015).

Figure 2.2 illustrate the life and non-life insurance GPW and their penetration rates, which clearly demonstrate a year-to-year increase for the period 2011 to 2015. This shows the high penetration of life insurance in the country's insurance industry.

Table 2.12: Stylised facts on the life insurance market in South Africa

	2005	**2013**
Life insurance GPW	US$25,731,96 million	US$41,799,87 million
Penetration rate	-	15,4%
Life penetration rate	10,32%	10,91%
Number of life firms	-	74
Minimum capital	-	ZAR10 million
Number of business lines	6	6

Note. Data for life insurance market facts from FSB (2015), Swiss Re Sigma (2014), AIO (2016), African Development Bank Group (2016), and Africa Reinsurance Pulse (2015).

Swaziland

Swaziland's insurance sector is regulated and monitored by the Financial Services Regulatory Authority (FSRA). Here, the insurance industry remains small and is at best at a developmental stage with a total of 10 insurance companies, six being life-insurers and four being non-life insurers. The non-life sector was the industry's key growth driver, accounting for 50,8% of GPW in 2012.

Table 2.13: Stylised facts on the life insurance market in Swaziland

	2009**	2013
Life insurance GPW	US$17,81 million	US$37,91 million
Penetration rate	-	2,3%
Life penetration rate	0,561%	1,195%
Number of life firms	-	5
Minimum capital	-	SZL2 million
Number of business lines	-	-

Notes. Data for life insurance market facts from Swiss Re Sigma (2014), African Development Bank Group (2016) and Africa Reinsurance Pulse (2015). **The available data for total GPW for Swaziland starts in 2009. The prior periods (years) had no data for life insurance. Despite the missing data, it is evident that the insurance market for the country is fairly developed as compared to other SADC member states (Malawi, Mozambique and Madagascar), given its penetration rate of 2,3%.

Tanzania

The Tanzania Insurance Regulatory Authority (TIRA) is an entity that was established for administering, monitoring, and overseeing the country's insurance sector. According to the Tanzania Insurance Regulatory Authority (TIRA, 2015), insurance penetration stayed constant at 0,7% from 2012 to 2015, while the contribution of insurance to the financial sector decreased from 20,6% in 2014 to 19% in 2015.

Tanzania's life insurance market is at a developmental stage, as life insurance accounts for 10% of the total GPW in the country (BMI Research, 2016). Key economic challenges affecting the growth of life insurance are poverty levels, low life expectancy, and consumers' unawareness of life insurance's benefits. BMI Research (2016) forecasted a 13,5% growth in premiums, reflecting growth of US$35 million.

Table 2.14: Stylised facts on the life insurance market in Tanzania

	2005	2013
Life insurance GPW	US$8,14 million	US$34,90 million
Penetration rate	-	0,9%
Life penetration rate	0,057%	0,106%
Number of life firms	-	-
Minimum capital	-	TZS1,5 billion-TZS 5 billion
Number of business lines	-	5

Note. Data for life insurance market facts from Swiss Re Sigma (2014), AIO (2016), African Development Bank Group (2016), Africa Reinsurance Pulse (2015), and TIRA (2012).

Zambia

The Pensions and Insurance Authority (PIA) in Zambia regulates and supervises the pension and insurance industries. The GPW of the insurance industry recorded an increase of 18% at the end of 2015 (Pensions and Insurance Authority [PIA], 2015). As of 2015, the insurance penetration stood at 0,67%, compared to 1,5% in the previous year (PIA, 2015).

Table 2.15: Stylised facts on the life insurance market in Zambia

	2005	**2013**
Life insurance GPW	US$18,984 million	US$94,39 million
Penetration rate	-	1,4%
Life penetration rate	0,249%	0,342%
Number of life firms	-	8
Minimum capital	-	US$200 000
Number of business lines	-	-

Note. Data for life insurance market facts from Swiss Re Sigma (2014), African Development Bank Group (2016), Africa Reinsurance Pulse (2015), and PIA (2013).

Zimbabwe

The Insurance and Pension Commission (IPEC) administers the insurance and pension industries in Zimbabwe. For the quarter ending 21 March 2016, 81% (US$70 million) of net GPW was attributed to the top three companies, showing that the life insurance market in Zimbabwe is highly concentrated (Insurance and Pension Commission [IPEC], 2016).

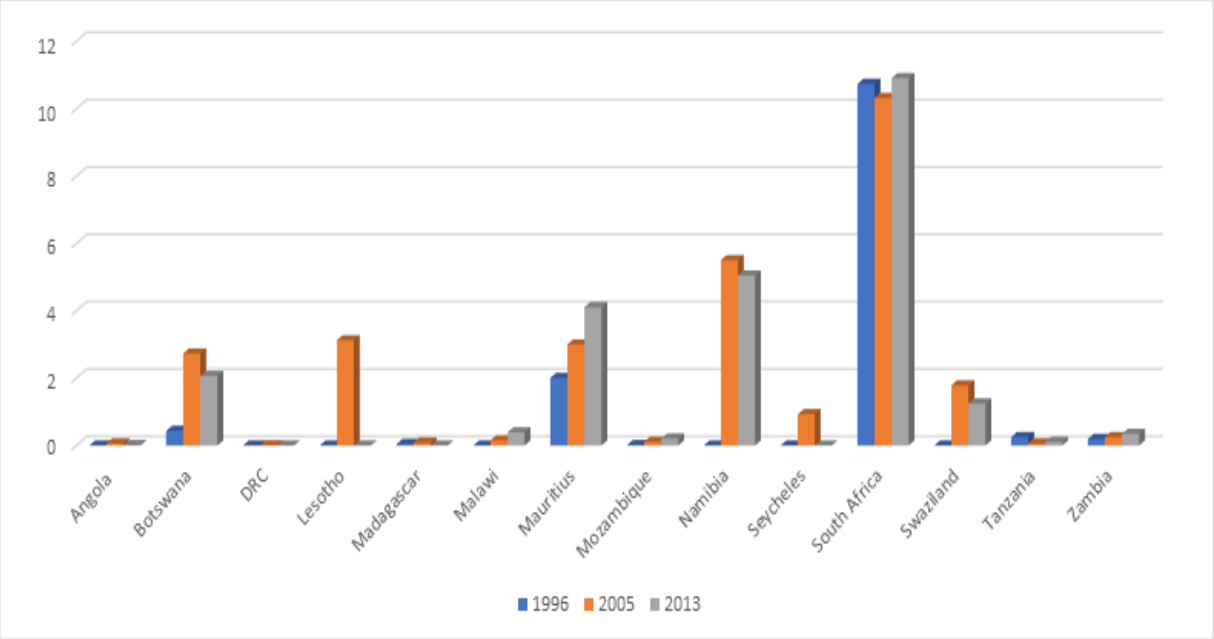
Owing to the economic challenges facing the country, the insurance penetration ratio has declined from 6% to 2% in the past decade (Allianz Global Corporate & Specialty, 2016). Life companies paid US$46 million in net claims, and total net claims had risen to 41% compared to the net premium advance of 18%, demonstrating disproportionately adverse conditions given the testing investment climate (IPEC, 2016).

Table 2.156: Stylised facts on the life insurance market in Zimbabwe

	2009	2013
Life insurance GPW	US$34,57 million	US$258,31 million
Penetration rate	-	3,1%
Life penetration rate	-	-
Number of life firms	-	10
Minimum capital	US$500 000	US$1,5 million
Number of business lines	-	-

Note. Data for life insurance market facts from IPEC (2010, 2013), African Development Bank Group (2016), and Africa Reinsurance Pulse (2015).

Figure 2.3: SADC countries life insurance premiums for the period 1996 to 2003



Data sourced from Sigma Premium Sigma reports (Swiss Re, 2014) *Data available for Seychelles was for a two-year period (2005-2006). **Data for Zimbabwe was for the period 1996-1998. ***Lesotho data is from 2004-2007 then 2001-2002. ****Swaziland and DRC had missing data for different years.

Figure 2.3 demonstrates SADC member states' life insurance premiums as relative to GDP. The graph depicts a high penetration of life insurance for South Africa for the period 1996 to 2013. Namibia has the second highest penetration ratio after South Africa. Mauritius' life insurance penetration rate shows growth for all periods observed. Botswana's life insurance also shows positive signs of growth for the period 1996 to

2015, but the period 2005 to 2013 experienced a decline. Lesotho's penetration ration is only observed for the 2005 period.

2.4 Theories of life insurance consumption

There are four significant theories that underline the consumption of life insurance:

1. Absolute income hypothesis (Keynes, 1883 - 1946)
2. Relative income hypothesis (Duesenberry, 1949)
3. Life cycle hypothesis (Ando & Modigliani, 1963)
4. Permanent income hypothesis (Friedman, 1957)

The academic literature differentiates between consumption theories with attention to price, income, levels of interest, and population design, since these influence consumption.

2.4.1 Absolute income hypothesis: Keynesian theory of consumption

The absolute income hypothesis is based on what Keynes described as fundamental psychological law which states that, individuals in general are permitted to hinge on, with countless assurance from facts of human nature (Dwivedi, 2010). Keynes specified that men are inclined to increase their consumption as their incomes rise; he posited that this law can be derived from people's information about human nature, and from their knowledge of reality. Keynes observed several factors that determined household consumption, but he concluded that levels of income are the main influence on an individual's consumption patterns.

Keynes observed that household controls presented expenditure patterns based on their existing income, hence asserting that a change in consumption is determined by a change in income. The absolute income theory of consumption assumes that present consumption spending rests on total existing income (Dwivedi, 2010). The concept submits that the marginal propensity to consume (MPC) declines as families try to lessen their spending on goods and services. One limitation of this theory is that it was based more on self-examination than observed facts, and it was not supported by empirical data on consumption and disposable income.

2.4.2 Relative income hypothesis: Duesenberry's theory

Due to the drawbacks of the Keynesian theory of consumption, Duesenberry (1949) used income and consumption data of the 1940s to advocate for the relative income theory of consumption, also referred to as the relative income hypothesis (Dwivedi, 2010). Duesenberry's theory, published as *Income, Saving, and the Theory of Consumer Behavior* (1949), stated that when making consumption and savings decisions, an individual will compare him- or herself to the current income of the population with which she/he identifies, as well as with his or her own levels of past consumption (Altman, 2015).

This theory links the spending levels on goods and services of a household according to income groups, by comparing the levels of income and spending. The theory states that, compared to households with high-income levels, households with lower income levels that are located in the vicinity of higher income areas are inclined to overspend. The absolute and relative income hypotheses propose that an increase in relative income causes a proportional increase in consumption. Duesenberry argued that, when absolute income increases, absolute consumption also increases, but when absolute income decreases, households do not cut their consumption patterns in line with the decline in their income (Dwivedi, 2010).

2.4.3 Life-cycle hypothesis

The life-cycle theory of Ando and Modigliani (1963) rejected the Keynesian consumption theory. It hypothesised that specific spending at any time rests on the availability of resources, the degree of return on capital, and the individual's age (Dwivedi, 2010). The theory states that an individual's planning of his consumption strategy does not solely rest on current income, but on future prospects of income in a lifetime.

2.4.4 Permanent income hypothesis

Friedman (1957) rejected the current income hypothesis and developed a theory of consumption known as the permanent income hypothesis. This hypothesis links permanent consumption and permanent income patterns for every consumer. The hypothesis states that individual consumption is not determined by current income, but

by future expected income. The hypothesis posits that present income does not control the level of existing consumption, but that spending patterns are influenced by permanent income.

Freidman cautioned against the consumption pattern by stating that the effect of inheritance is to increase the permanent income of the unit, and that this would justify higher consumption in the final period of life. The theory postulates that consumption is the function of permanent income (Dwivedi, 2010).

2.4.5 Life insurance demand

The life insurance consumption theoretical model was primarily established by Yaari (1965), Hakansson (1969), Fischer (1973), and Lewis (1989). In most academic and theoretical research developed for the investigation of life insurance demand, the works of Yaari (1965) and Hakansson (1969) are acknowledged as the point of departure.

Yaari advanced a theoretical model that explained life insurance demand by applying the life-cycle hypothesis of Ando and Modigliani (1963) to a consumer assuming optical consumption and saving plans. Yaari's life-cycle model with uncertain lifetime hypothesis posits that wealth, interest rates, projected income levels, and the expected discounted rate of life policies, influence life insurance demand. This theoretical model is considered to be a well thought-out and definitive study on life insurance consumption.

Hakansson (1969) considered a model with an individual lifetime as a random variable, with known probability distribution and utility function representing the individual bequest motive. The introduction of an uncertain lifetime had two effects: it led to a decrease in the patience rate of consumption, and it reduced the borrowing power given that s/he had a non-capital income stream. Hakansson (1969) suggested that the degree of life insurance demand is determined by wealth, income level, interest rates, and cost-price. The conclusions of the study present similar observations made by Yaari (1965) on life insurance consumption.

Mantis and Farmer (1968) examined the effect of marital status on the life insurance demand of a family unit. Their expectation was that married men would purchase life

insurance, more so than single men. However, their empirical study presented an adverse correlation between life insurance premium expenditure and marriage.

Fischer (1973) developed a single-period term assurance model in the life-cycle framework and arrived at the conclusion that life insurance consumption was a function of labour income and relative weight of the bequest function. Fischer also stated that a wage earner was expected to buy an insurance policy, as opposed to a wealthy individual. As per his hypothesis, a wage earner was likely to purchase life insurance early in life and sell it late in life.

Pissarides (1980) begin the life-cycle model, by stating that uncertainty about age of death would yield two motives for saving for retirement and leaving a bequest. Without life insurance, the bequest arising from an individual's death would be equal to the wealth he had when he died. According to Kutty, (2008), the requirement on both spending and the bequest of income is removed by the presence of a life insurance policy.

The study of Lewis (1989), which adopted Yaari's (1965) life insurance framework, suggests that the immediate objective for an individual when purchasing a life policy is to maximise returns for the remaining dependents. The importance of buying life insurance is to provide an inheritance to the remaining dependents due to the possible loss of income. Campbell (1980) argued for labour income uncertainty as the basis of the life insurance purchase. Campbell (1980) noted that the problems of life insurance, in essence, are that it is confined to one setting, that the only cause of hesitation is age at the demise of a family income recipient, and that the unit option is limited to decisions of spending.

The above-mentioned models suggest a provision of resources to optimise an anticipated lifetime worth of consumption. In meeting the implications of an uncertain lifetime, life insurance has the potential to increase utility on the highest expected outcome. Outreville (1996) states that the consumption theory models suggest that the justification of life insurance consumption should depend on wealth, expected income streams over a lifetime, interest rates, premium prices, and personal consumer efficacy for wealth and consumption.

Life insurance consumption is not simply influenced by buyer demand; aspects such as price and availability of life insurance impact demand (Beck & Webb, 2002). To adequately measure the pricing and requirements of products, insurance companies require the skills of humans and technological resources to effectively invest in opportunities that exist in the financial markets. Beck and Webb (2002) further indicate that the essential operationalisation of agreements, coupled with the preservation of property rights, can facilitate life insurance's investment function. The substantial determining factor in life insurance demand is the component of price charged. Various aspects, like the level of economic security in a country, banking sector development, urbanisation, quality of the bureaucratic system, corruption, rule of law, the total fee of insurance, and educational attainment, influence the insurers' propensity to determine productive insurance costs.

2.5 Review of empirical literature

This section is devoted to reviewing some of the literature around the factors that determine life insurance consumption. Numerous variables, identified by several scholars, have positive or negative relationships to life insurance demand. But among all variables that impact life insurance consumption, income is central – especially for developing economies.

It is expected that a rise in income will significantly stimulate spending on insurance, and that such an upsurge would reflect in the total insurance income or penetration ratio (Kutty, 2008). Kjosevski (2012) observed that the possibility of a worker passing away at a family unit's existing spending levels, linked with the intention of lowering uncertainty, spurs the consumption of life insurance. As outlined by Chistea et al. (2014), insurance industry stimulates economic and structural progress across numerous networks, by:

- Offering protection to industries or firms;
- Stimulating entrepreneurial attitudes;
- Encouraging investment;
- Increasing the number of financial intermediaries through the creation of liquidity;
- Increasing savings through life insurance products; and

- Promoting risk prevention by companies and/or people.

Hammond, Houston, and Melander (1967) undertook a study using regression analysis to examine demographic and economic factors that impact on life insurance demand. The results revealed that net-worth holdings, income, education, life insurance stage, and occupation, influence the consumption of life insurance. Employing time series regression, Neumann (1969) investigated the effect of inflation on life insurance consumption and concluded that inflation had no influence on the demand for life insurance.

A conventional model that examined life insurance supply and demand, employing a cross-sectional model and time-series data covering 10 countries for the period 1970 to 1981, revealed that dependency ratio, life expectancy, and income impact the consumption of life insurance (Beenstock, Dickinson & Khajuria, 1986). Numerous academic studies, such as the work of Browne and Kim (1993) and Outreville (1996), rely on cross-country data. Browne and Kim (1993) used cross-sectional data of 45 countries for the year 1987, while Outreville (1996) based his conclusions on cross-sectional data of 48 countries for the year 1986. Browne and Kim (1993) concluded that dependency ratio, social security, inflation, religion, income, and insurance pricing are factors that impact the consumption of life insurance. Outreville (1996) concluded that higher education, agricultural status, competition in the local market, health status, and financial development impact life insurance demand.

When they studied life insurance demands by means of a cross-sectional panel of 68 countries for the period 1980 to 1986, Beck and Webb (2002) identified inflation, educational attainment, and banking-sector development as predictors of the demand for life insurance. Income was identified as a weak predictor.

A study by Zhang and Zhu (2003) examined the determinants of insurance in China under globalisation, using data from 225 cities. Per capita GDP was identified as the sole factor important for the measurement of life insurance demand. Econometric outcomes identified attainment of higher education, population, youth dependency, social welfare expenditure, savings deposits, and telephone ownership per capita as significant in influencing the consumption of life insurance.

A study by Beck and Webb (2003) focused on 68 countries using a panel with aggregate data for the period 1961 to 2000 to measure the determinants of life insurance consumption. Their findings identified banking-sector development, institutional indicators, income per capita, and inflation as predictors of life insurance consumption. Life expectancy, education, size of the social security system, and the young-dependency ratio were identified as not having an effect on life insurance demand. A cross-sectional examination of life insurance demand in China, Hong Kong, and Taiwan identified different factors that drive insurance in each of the countries investigated. The findings revealed that income, education, and economic development have a significant influence on life insurance consumption (Hwang & Greenford, 2005).

Ye, Li, Chen, Moshirian, and Wee (2009) studied the causes of foreign participation in life insurance markets by using cross-sectional data for 24 OECD countries from 1993 to 2000. They identified socio-economic and market-structure factors as influencing foreign participation in life insurance markets. Life expectancy, foreign market share, income, dependency ratio, financial development, competition level, economic growth, and market liberalisation were shown to have a positive influence on foreign participation in the development of life insurance markets. Social security expenditure was found to have a negative influence. Legal indicator variables (institutional quality[4]) showed a positive influence on foreign participation in life insurance markets.

In another cross-sectional panel study of 90 countries from 2000 to 2008 investigating determinants of life and non-life premiums, the findings identified capital income, population size and density, demographic structures, income distribution, public pension size, state ownership of insurance companies, the availability of private credit, and religion as predictors of life and non-life insurance premiums (Feyen, Lester, & Rocha, 2011).

[4] The institutional quality variables were common law, political stability, government effectiveness, regulatory quality, rule of law, and control of corruption.

A study of 30 OECD countries' life insurance consumption for the period 1993 to 2000, which employed cross-sectional data, identified high education levels, number of dependents, income, financial development, and competition as robust predictors for the demand for life insurance consumption (Li, Moshirian, Nguyen, & Wee, 2007). A study by Chang and Lee (2012) examined the non-linear relationship between life insurance and economic development, employing data from 92 countries for the period 1996 to 2008. The study further examined the significance of institutions on life insurance development, and concluded that legal and political conditions have a positive influence on life insurance in low-income countries (Chang & Lee, 2012). Their study revealed that institutions' influence on activities in the life insurance market declines with increasing economic development.

Kjosevski (2012) undertook a cross-panel study of central and southeastern European life insurance determinants for the period 1998 to 2010. The findings found health expenditure, inflation, education level, rule of law, and GDP per capita to influence life insurance demand. The study further determined that real interest rates, ratio of quasi-money, youth dependency ratio, old-age dependency ratio, control of corruption, and government effectiveness had no influence in life insurance demand (Kjosevski, 2012).

Dragos (2014) examined a number of variables in Europe and Asia that influence life and non-life insurance demand using econometric panel data from 17 emerging economies for a 10-year period. The results showed a different outcome, and urbanisation was identified as a variable that impacts the demand for life insurance in Asia, while urbanisation was shown to be insignificant in Europe. Education was a predictor for the non-life insurance market in emerging countries, while income had no significant impact on the non-life insurance market in Asia (Dragos, 2014).

A recent study employing different models to determine drivers of life insurance in Ethiopia, for the period 1979/1980 to 2007/2008, identified inflation and youth dependency ratio as having a negative influence on life insurance demand, while inflation was observed to have similar impacts on the supply side of life insurance (Sulaiman, Migiro, & Yeshihareg, 2015). The old-age dependency ratio was identified as having a positive and significant relation to life insurance supply.

Guerineau and Sawadogo (2015) examined the life insurance demand of 20 countries in Sub-Saharan Africa for the period 1996 to 2011, highlighting the role of institutional quality and its impact on economic development. Employing the instrumental variable technique, the results showed that insurance premiums increase as incomes rise. Youth dependency ratio and life expectancy displayed a negative influence on the progress of life insurance, whereas a positive influence was observed by the old-age dependency ratio on life insurance demand. The protection of property rights and government firmness were shown to have a positive influence on life insurance consumption.

A study by Laurent and Kivyiro (2015) of life insurance determinants employed ordinary least square (OLS) regression analysis of time series data for the period 1981 to 2013 in Kenya, and 1981 to 2012 in Nigeria and South Africa. The outcomes showed that macroeconomic and demographic factors influenced life insurance demand in the three countries. The results for GDP per capita, level of education, and life expectancy where startling and required additional exploration. Laurent and Kivyiro (2015) could not arrive at a sole variable persuading life insurance demand.

Alhassan and Biekpe (2016) examined life insurance consumption in Africa for 31 African countries using both OLS and instrumental variables regression for the period 1996 to 2010. The study found a positive impact for health expenditure and financial development on life insurance demand (Alhassan & Biekpe, 2016). Factors that exhibited a negative relation to life insurance consumption were identified as inflation, dependency ratio, urbanisation, life expectancy and income[5] (Alhassan & Biekpe, 2016). Institutional quality was revealed to be an important positive stimulus for life insurance demand (Alhassan & Biekpe, 2016).

Zerriaa, Amiri, Noubbigh, and Naoui (2017) examined macroeconomic factors influencing life insurance demand in Tunisia, using the multiple regression log-linear model for the period 1990 to 2014. The study concluded that dependency ratio, life expectation at birth, and urbanisation spurred life insurance demand, while higher

[5] Elasticity of demand for life insurance in Africa is at 1% and 5% in OLS and D-GMM estimations.

levels of education diminished it (Zerriaa et al., 2017). Income and financial development were recognised predictors in life insurance demand.

Table 2.167: Determinates of life insurance consumption in empirical literature

Categories	Variables	Positive relation	Negative relation	Non-significant/ relationship inconclusive
		Sources	**Sources**	
Macroeconomic	**Income**	Hakansson (1969), Fischer (1973), Kutty (2008), Outreville (1996), Hammond et al. (1967), Beenstock et al. (1986), Browne & Kim (1993), Beck & Webb (2002), Beck & Webb (2003), Hwang & Greenford (2005), Feyen et al. (2011), Ye et al. (2009), Li et al. (2007), Zerriaa et al. (2017), Guerineau & Sawadogo (2015)	Alhassan & Biekpe (2016)	
	Inflation	Browne & Kim (1993), Beck & Webb (2003, 2002), Kjosevski (2012)	Neumann (1969), Sulaiman et al. (2015), Alhassan & Biekpe (2016)	
	Financial development	Outreville (1996), Beck & Webb (2002, 2003), Feyen et al. (2011), Li et al. (2007), Ye et al. (2009), Alhassan & Biekpe (2016); Zerriaa et al. (2017)		
Demographic	**Urbanisation**	Dragos (2014), Zerriaa et al. (2017)	Alhassan & Biekpe (2016)	
	Education	Outreville (1996), Zhang & Zhu (2003), Hwang & Greenford (2005), Beck & Webb (2002); Li et al. (2007), Kjosevski (2012)	Beck & Webb (2003), Alhassan & Biekpe (2016), Zerriaa et al. (2017)	Dragos (2014), Laurent & Kivyiro, (2015)
	Health expenditure	Kjosevski (2012), Alhassan & Biekpe (2016)		

Categories	Variables	Positive relation	Negative relation	Non-significant/ relationship inconclusive
		Sources	**Sources**	
	Dependency	Beenstock et al. (1986), Browne & Kim (1993), Zhang & Zhu (2003), Ye et al. (2009), Sulaiman et al. (2015), Zerriaa et al. (2017), Guerineau & Sawadogo (2015)	Beck & Webb (2003), Sulaiman et al. (2015), Alhassan & Biekpe (2016), Guerineau & Sawadogo (2015)	Kjosevski (2012)
	Life expectancy	Beenstock et al. (1986), Ye et al. (2009), Sulaiman et al. (2015), Zerriaa et al. (2017)	Beck & Webb (2003), Guerineau & Sawadogo, (2015), Alhassan & Biekpe (2016)	Laurent & Kivyiro (2015)
	Institutional quality	Beck & Webb (2003), Ye et al. (2009), Chang & Lee (2012), Kjosevski (2012), Alhassan & Biekpe (2016)		

** Old-age dependency ratio*

***Youth dependency ratio*

Chapter 3:

Methodology

3.1 Introduction

Newman and Benz (1998) emphasise the importance of validity in deriving research methods, as failure to observe this principle will render the enquiry results unsatisfactory and of no benefit. This chapter aims to explore the research question of the study by presenting the research methodology and design. The research methods will provide a framework and examination of the manner in which the enquiry will be delivered. The examination is descriptive and seeks to provide an introductory enquiry into determinants of life insurance penetration in the SADC region. It will draw lessons from developed countries, signal the economic benefits associated with the industry, and provide recommendations on how the region can create a healthy, stable insurance market. The research limitations will also be provided. Future research recommendations on the demands for life insurance in the region will also be made.

3.2 Research design and data

This study employed annual cross-sectional data of 15 SADC member states for the period 1995 to 2013. The period was selected according to data availability for the identified variables in the study, as well as for determining factors that influence life insurance consumption/demand. The key variables employed in the regression model to examine how consumption of life insurance is influenced were income, inflation, financial development, urbanisation, education, health expenditure, dependency, life expectancy, and institutional quality.

Secondary data was used to provide responses to the research question. The Global Financial Development Database (GFDD), Worldwide Governance Indicators (WGI), and state department records are the main sources of information and are official data archives. The above sources of information were used to obtain secondary historical cross-country data for all variables used in the research, for the period 1995 to 2013.

The use of secondary data had advantages for this research as it included macroeconomics factors, which the researcher consequently did not have to devote time to find data for. Governments and private companies often use secondary macroeconomic data for their own research; therefore, such data has been tested and used in different studies. In some instances, the researcher had to pay for secondary data sets, but this was nevertheless more cost-efficient than compiling primary data.

One disadvantage of secondary data is that the administration might place a reduced amount of value on the data. This study used cross-country panel data from the SADC region for the period 1995 to 2013 to identify variables that impact on the demand for life insurance.

3.3 Target population

A target population for a study is meant to stipulate types or categories of housing units that are fundamental to the population study and the time spreads of the group (Groves et al., 2004). Bless, Higson-Smith, and Kagee (2006) posit that a target population is an establishment of a basic group on which the examination's emphasis, and the outcomes attained by the testing sample, ought to be observed.

The SADC region was the targeted population of the study, and key variables of cross-historic data were used to respond to the research question. SADC countries used in the study were Angola, Botswana, the DRC, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia, and Zimbabwe.

3.4 Empirical model

To investigate the determinants of life insurance penetration in SADC countries, the enquiry adopted the empirical research model of Alhassan and Biekpe (2016) as specified in equations 1 and 2:

$$LIFE_{i,t} = \beta_1 INCOME_{i,t} + \beta_2 CPI_{i,t} + \beta_3 FINDEV_{i,t} + \beta_4 URB_{i,t} + \beta_5 EDUT_{i,t} + \beta_6 HEXP_{i,t} + \beta_7 DEP_{i,t} + \beta_8 LEXP_{i,t} + \beta_9 INST_{i,t} + \mu_i + \in_{i,t} \quad (1)$$

$$LIFE_{i,t} = \beta_1 LIFE_{I,t-1} + \beta_2 INCOME_{i,t} + \beta_3 CPI_{i,t} + \beta_4 FINDEV_{i,t} + \beta_5 URB_{i,t} + \beta_6 EDUT_{i,t} + \beta_7 HEXP_{i,t} + \beta_8 DEP_{i,t} + \beta_9 LEXP_{i,t} + \beta_{10} INST_{i,t} + \mu_i + \in_{i,t} \quad (2)$$

where *i* and *t* denote the cross-sectional country unit and year respectively, $Life_{i,t}$ is the ratio of life insurance penetration to GDP, income is proxied as the log of GDP per capita, CPI is the inflation level in a specific country, FINDEV is the money supply/GDP ratio, URB is the percentage of urban population, EDUT represents a percentage of population ages 25 and over with bachelor degrees, HEXP is the health expenditure per GDP, DEP is the age dependency ratio per country, LEXP is the average life expectancy per country, and INST is the average of six indicators of institutional quality.

Table 3.1: Definitions of variables, descriptions and sources of data

Abbreviation	Variables	Description	Sources of data
	Dependent variable		
LIFE	Life insurance penetration	Life insurance premium / GDP	GFDD
	Independent variables		
INCOME	Income	GDP per capita in US$	WDI
CPI	Inflation	Consumer Price Inflation	WDI
FINDEV	Financial Development	Money supply (% of GDP)	WDI
URB	Urbanisation	Urban population (% of total)	WDI
EDUT	Education attainment	Percentage of population ages (25 and over with bachelor degree)	WDI
HEXP	Health expenditure	Health expenditure / GDP	WDI
DEP	Age dependency ratio	Population of dependency (15 to over 65 working age)	WDI
LEXP	Life expectancy	Average life expectancy	WDI
INST	Institutional quality	Average of six indicators of institutional quality	WGI
CC	*Corruption control*	=	WGI
GE	*Government effectiveness*	=	WGI
PS	*Political stability*	=	WGI
RQ	*Regulatory quality*	=	WGI
RL	*Rule of law*	=	WGI
VA	*Voice and accountability*	=	WGI

3.3.1 Description of variables

This part of the study aims to provide motivation for each chosen independent variable and to articulate how the changes in each impact life insurance consumption. The demographic and macroeconomic factors will reveal how the increase/decrease of each factor affects life insurance demand.

Income

Increased income levels of a country have a positive influence on life insurance demand; rising income per capita is therefore expected to influence life insurance demand (Dragos, 2014). The capacity to afford a life insurance policy is to be associated with a rise in income level.

Luciano, Outreville, and Rossi (2015) estimated the stimulus of microeconomic factors on life choices for males and females, and found that insurance demand is very much connected to income. Many studies have identified income level as a factor that has a positive and significant relationship to life insurance consumption (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; Kuddy, 2008). However, as per Table 18, Alhassan and Biekpe (2016) detected a negative relationship between income level and life insurance demand in Africa. The hypotheses of the study as indicated in Chapter 1.3.3 expect income to be a predictor of life insurance demand in the SADC region.

Inflation

SADC countries experience volatile inflation rates, and although this phenomenon occurs in all market economies worldwide, its impact on developing countries can deter development. A stable level of inflation can allow business to flourish without the dipping of household savings and their purchasing power. The regular increase in prices of goods and services due to inflation can hurt the affordability level of households. Li et al. (2007) and Ayaliew (2013) found inflation to have a negative influence on the demand for life insurance, its impact being the decrease of consumption owing to the escalation of prices. Neumann (1969) observed that inflation

had no significant impact on life insurance demand. In this study, inflation was expected to decrease life insurance demand.

Financial development

Several studies on the demand for life insurance have found that financial development has a positive influence on life consumption (Steyn et al., 2011; Li et al., 2007; Outreville, 1996; Beck & Webb, 2002; Alhassan & Biekpe, 2016). A vibrant insurance industry has the potential to impact and reinforce the development of finance or banking sectors; however, a significant relationship between these segments cannot be deduced to be a confirmation of interconnection (Beck & Webb, 2002). Based on the above, the study anticipated a robust relationship concerning financial development and the demand for life insurance.

Urbanisation

In a study addressing the challenges and opportunities in emerging markets, insurers stated that increased urbanisation would stimulate financial literacy, which in turn would spur life insurance demand (Swiss Re, 2014). Dragos (2014) found urbanisation to have a positive, robust influence on life insurance demand.

Education attainment

An educated population views the purchasing of a life insurance policy as a practice of savings as it provides financial security to a spouse and children in the event of death. A Ćurak, Džaja, and Pepur (2013) study agreed that education has a great influence on life insurance. Several empirical studies came to the same conclusion (Hammond et al., 1967; Zhang & Zhu, 2003).

Health expenditure

As government expenditure on social security increases, so the need to secure life insurance by a household decreases (Beenstock et al., 1986). This suggests that government expenditure impacts negatively on the demand for life insurance. Conversely, studies by Kjosevski (2012) and Alhassan and Biekpe (2016) came to a different conclusion.

Age dependency ratio

Beenstock et al. (1986), Zhang and Zhu (2003), and Zerriaa et al. (2017) found age dependency to be an instrumental variable in the demand for life insurance. Beck and Webb (2003) concluded that the youth dependency ratio has a negative relationship to life insurance demand.

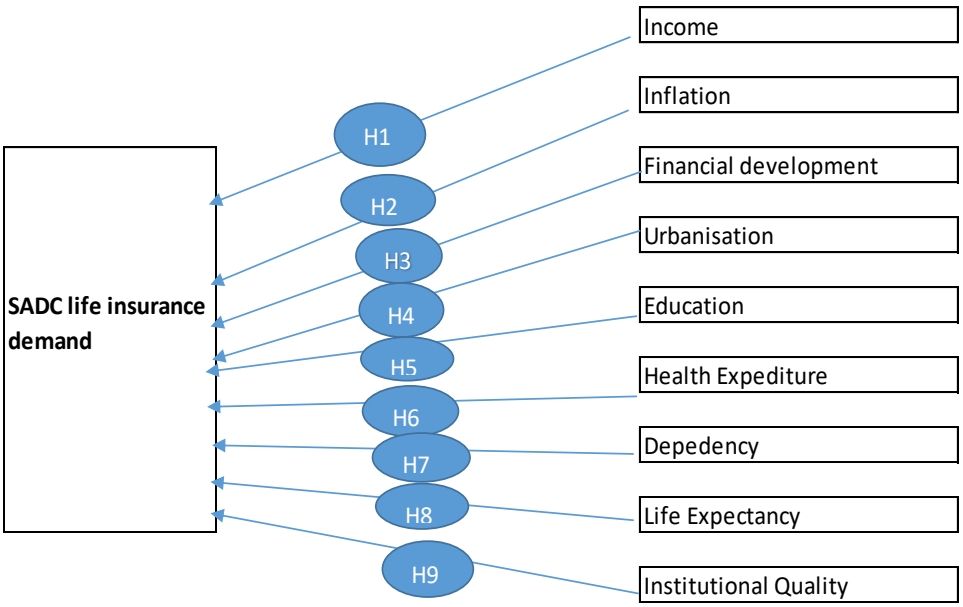
Life expectancy

Several studies have concluded that life expectancy has a negative influence on the demand of life insurance (Li et al., 2007; Beck & Webb, 2002; Alhassan & Biekpe, 2016), while other studies found a positive relationship (Beenstock et al., 1986; Outreulle, 1996). The hypothesis of this study expects a negative relationship between life expectancy and the demand for life insurance.

Institutional quality

A healthy life insurance market flourishes in a country with strong institutions and a politically safe environment where rule of law is upheld. In their study of non-life insurance penetration, Erbas and Sayers (2016) posited that institutional quality may be a good indication of doubt. Their study concluded that institutional quality, transparency, and the uncertainty nexus are the foremost causes of insurability across countries. Insurability is lower when governance is weaker.

Figure 3.1: Independent variables hypotheses with SADC life insurance demand



Developed for the research: Authors computation

3.5 Estimation technique

This study used two methods of estimation, fixed effect (FE) and system general methods of moments (GMM). FE is used to control for endogeneity across countries and time (Beck & Katz, 1995). The choice of FE was determined by the Hausman specification test result. The GMM[6] estimation will be used for Equation 2 of Holtz-Eakin et al. (1988). Arellano and Bond (1991) address the simultaneity (relationship between two variables) partiality in the presence of lagged dependent variables among the independent variables. A GMM estimator is applied to correct for bias caused by

[6] GMM demands the description of a set of moment situations which the model must contend with; GMM is an estimation technique which submits that the unidentified limits ought to be estimated by corresponding population moments with suitable sample moments Matyas (1999).

endogenous explanatory variables. For GMM estimation, both system GMM approaches are used and results reported.

3.6 Limitations of the study

The research only focused on the demand for life insurance in the SADC region. The findings might differ from those of other regions due to various factors, one being the large gap in data stemming from absences of data from country to country. The period of study and the sample size as a panel are also study limitations.

Chapter 4:

Discussion of findings

4.1 Introduction

In this chapter, the empirical findings of life insurance demand or consumption (used interchangeably henceforth) in the SADC region will be presented. The impact of each variable is discussed. The descriptive statistics are discussed to give a succinct overview of the data, as well as the policy implication of each variable on the demand for life insurance. Extensive discussions on empirical findings are provided and channelled through the variables that affect life insurance demand in the SADC region. A consistent theoretical underpinning is provided, and causal relationships are discussed using a correlation matrix.

4.2 Descriptive statistics

Table 4.1 shows the outlines of the descriptive statistics for all variables. This table reports the mean, standard deviation, maximum, minimum, and the number of observations for each of the variables. The mean in the table was calculated to discover the dominant inclination for each variable for the total number of observations for that specific variable. The standard deviation specifies the sample's dispersion level for each specific variable.

From Table 4.1, the averages of all variables used are presented. The averages of the variables used in this study are for SADC countries for the period 1995 to 2013. These include the 15 member states in the region. For example, the average of the demand for life insurance (LIFE) is 2,157 in the SADC region. Notable deviations are for health expenditure (HEXP), GDP per capita (INCOME), and tertiary education attainment (EDUT), and most of the institutional quality variables have higher deviations. The numbers of observation are balanced on the range of 200 to 300 observations. The tertiary education attainment (EDUT) variable has the smallest number of observations compared to the other variables used in this study.

Eight main variables and six institutional quality variables were included to determine the role institutions play in the demand for life insurance in the SADC region.

Table 4.1: Descriptive statistics

Variables	Mean	Standard deviation	Minimum	Maximum	Number of observations
LIFE	2.157	3,576	0,000661	15,78	203
INCOME	2,451	2,942	102,6	15,687	285
CPI	66.93	33,73	0,000700	166,1	262
FINDEV	169,6	1,544	1,617	18,347	273
URB	35,17	12,31	13,26	63,79	285
HEXP	133,4	152,0	4,032	686,9	280
DEP	81,22	18,21	40,92	102,6	285
LEXP	54,41	8,672	40,68	74,23	279
EDUT	6,424	7,713	0,305	39,73	155
CC	-0,297	0,701	-2,057	1,250	225
GE	-0,392	0,696	-1,974	0,965	225
PS	-0,0967	0,891	-2,989	1,189	225
RQ	-0,439	0,735	-2,413	0,997	225
RL	-0,386	0,756	-2,205	1,057	225
VA	-0,294	0,765	-1,880	1,025	225

Notes. LIFE=Life insurance penetration ratio; DEP=age dependency; INCOME=GDP per capita; CPI=Consumer Price Index; FINDEV=Financial development; URB=Urbanisation; HEXP=Health expenditure; EDUT=Educational attainment; CC=Control of corruption; GE=Government effectiveness; PS=Political stability; RQ=Regulatory quality; RL=Rule of law; VA=Voice and accountability.

In the correlation matrix in Table 4.2, LIFE is positively correlated with INCOME, financial development (FINDEV), EDUT, HEXP, government effectiveness (GE), regulatory quality (RQ), rule of law (RL), and voice and accountability (VA). Political stability (PS), corruption control (CC), urbanisation (URB), and inflation (CPI) have a small correlation with LIFE.

In contrast, age dependency (DEP) is negatively correlated with LIFE, CC, GE, PS, RQ, RL, and VA. INCOME is highly correlated with HEXP, EDUT, FINDEV, URB, and GE, all of them being positive. INCOME is negatively correlated with DEP.

Most of the institutional variables are positively correlated to each other and hold a magnitude greater than 0,5 across. The high values of correlation between variables signal a high possibility of multicollinearity between variables and possible challenges

for estimation using OLS. This study used the panel data analysis technique because panel data allows controlling for individual heterogeneity (Baltagi, 2005). Further estimations are done using FE and XTGLS to control for endogeneity and serial auto-correlation. System GMM and difference GMM is also estimated and results compared across different models of estimation.

Table 4.2: Correlation matrix

	LIFE	INCOME	CPI	FINDEV	URB	EDUT	HEXP	DEP	LEXP	CC	GE	PS	RQ	RL	VA
LIFE	1.0000														
INCOME	0.5605	1.0000													
CPI	0.2458	0.3964	1.0000												
FINDEV	0.6095	0.7629	0.3087	1.0000											
URB	0.4932	0.7233	0.1980	0.5424	1.0000										
EDUT	0.6222	0.7619	0.3854	0.8813	0.5369	1.0000									
HEXP	0.7514	0.9330	0.4367	0.7141	0.7438	0.7737	1.0000								
DEP	-0.6350	-0.8694	-0.2707	-0.8779	-0.6595	-0.8093	-0.8246	1.0000							
LEXP	0.2873	0.6300	0.4343	0.7567	0.4018	0.6583	0.5054	-0.7236	1.0000						
CC	0.4567	0.6220	0.1295	0.5922	0.6403	0.5879	0.6063	-0.7970	0.5475	1.0000					
GE	0.6085	0.7466	0.1461	0.7746	0.6368	0.7361	0.7285	-0.8919	0.5831	0.8826	1.0000				
PS	0.3830	0.5899	0.2302	0.5785	0.5486	0.5369	0.5383	-0.6691	0.5061	0.8082	0.8053	1.0000			
RQ	0.5761	0.6334	0.1833	0.7028	0.6056	0.7275	0.6516	-0.8006	0.5530	0.8449	0.9290	0.7887	1.0000		
RL	0.5355	0.6388	0.1315	0.7431	0.4924	0.6988	0.6136	-0.8480	0.6125	0.8583	0.9409	0.8280	0.9262	1.0000	
VA	0.5603	0.5737	0.1106	0.7202	0.5544	0.6470	0.5617	-0.7684	0.5872	0.8411	0.9160	0.8634	0.8856	0.9116	1.0000

Notes. LIFE=Life insurance penetration ratio; INCOME=GDP per capita; DEP=age dependency; CPI=Consumer Price Index; FINDEV=Financial development; URB=Urbanisation; HEXP=Health expenditure; EDUT=Educational attainment; CC=Control of corruption; GE=Government effectiveness; PS= Political stability; RQ=Regulatory quality; RL=Rule of law; VA=Voice and accountability.

4.3 Regression results

4.3.1 Statistic model estimation

Table 4.4 presents the results of FE estimates for life insurance demand in the SADC region from 1995 to 2013. One notable cautionary remark is that, despite the relatively long period under review, most variables are missing for some countries in the region. The total numbers for the 15 member states' data on various variables are included in the estimation models. Only 14 countries have enough data for estimation. The results were initially estimated using the FE estimation technique to control for endogeneity across countries and time.

The choice between FE and random effect was determined using the Hausman test for each model. Table 4.3 depicts the chi-square probability for all models estimated in the study. The null hypothesis is that random effect is the appropriate model for estimation. If the null hypothesis is rejected, then the FE should be used. The null hypothesis is rejected if the chi2-square probability is below 5%, i.e. FE should be used. From Table 4.3, it is observed that chi2-probability is less than 5% for all models. It suffices that FE can be used to estimate the results.

Table 4.3: Summary of Hausman test results for models 1-6

	Model 1: CC	Model 2: GE	Model 3: PS	Model 4: RQ	Model 5: RL	Model 6: VA
Chi2	214.77	98.33	27.46	49.20	24.43	68.43
Prob>Chi2	0.0000	0.0000	0.0006	0.0000	0.0019	0.0000

If Prob> ch2 <0.05 (i.e significant) use Fixed effects

With respect to the joint explanatory power of the independent variable, approximately 92% of the model is explained by the variables included in the model, as shown by the goodness of fit (R-square), i.e. the 92% variation in the models used here is explained by the variables used in the estimation.

From the FE estimation in Table 4.3, six estimations are undertaken where institutional variables are interchanged due to the high collinearity between variables. The estimated outputs from models 1 to 6 respectively cover stepwise estimations of institutional quality, such as CC, GE, PS, RQ, RL, and VA.

Across all models, a positive sign is observed for CPI under the FE estimations with a significance of 10%; this indicates that for each unit change in CPI, LIFE will increase by between 5,471 and 5,897 units. The outcomes are consistent with findings from Browne and Kim (1993), Beck and Webb (2003, 2002), and Kjosevski (2012). High levels of inflation drive up the cost of goods and services, and in turn diminish the purchasing power of households, resulting in increased household debt. To reduce the cost burden during price uncertainty, consumers tend to buy life insurance to counter the possibility of a rise in the cost of living, and as a mechanism for saving.

The coefficient for the HEXP variable is also positive and significant at 1%, which indicates that increases in health expenditure increase life insurance penetration among SADC countries. For each unit increase in health expenditure, life insurance will increase by about 16,7 units. As individual lifetimes are expected to get longer, the demands for health cover will also rise, resulting in a higher demand for life insurance. The HEXP results are consistent with findings by Kjosevski (2012) and Alhassan and Biekpe (2016).

Consistent with CPI and HEXP, the DEP variable is positive and significant at 5% in explaining life insurance consumption, in line with findings by Beenstock et al. (1986), Browne and Kim (1993), Zhang and Zhu (2003), Sulaiman et al. (2015), Zerriaa et al. (2017), and Guerineau and Sawadogo (2015). This suggests that increases in the age dependency ratio also increase life insurance demand. Health costs and other related costs are likely to increase as an individual grows older. Households are likely to purchase life insurance to cover the health costs, which are likely to arise due to old age. A rise in the number of old-age people in a society increases the demand for life insurance to cater for their health needs.

Across all the institutional quality indicators, only the VA component was observed to be negative and significant at 5% in model 6.

Table 4.4: Regression fixed effect static estimations

Variables	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Constant	-2 588,36	-2 390,50	-2 467,20	-2 665,75	-2 490.35	-3 150,953**
CPI	5,471*	5,897*	5,845*	6,211*	5.868*	5,587*
FINDEV	-2,264	-3,33	-2,575	-2,505	-2,313	-2,576
URB	10,793	12,848	8,698	8,413	7,431	12,849
EDUT	13,56	14,061	13,633	17,162	12,991	9,659
HEXP	16.685***	16,459***	16,628***	16.625***	16,676***	17,188***
DEP	47,530**	46,392**	47,843**	51,209**	48,251**	54,273***
LEXP	-30,088	-31,682	-31,392	-34,263	-31,188	-32,399
CC	-57,905					
GE		132,589				
PS			-3,502			
RQ				-161,521		
RL					-38,756	
VA						-291,619**
F test	381,117	349,947	504,659	380,116	306.,19	411,276
R-squared	0,919	0.92	0,919	0,92	0,919	0,922
Countries	14	14	14	14	14	14
Observations	119	119	119	119	119	119

Notes. LIFE=Life insurance penetration ratio; DEP=age dependency; INCOME=GDP per capita; CPI=Consumer Price Index; FINDEV=Financial development; URB=Urbanisation; HEXP=Health expenditure; EDUT=Educational attainment; CC=Control of corruption; GE=Government effectiveness; PS=Political stability; RQ=Regulatory quality; RL=Rule of law; VA=Voice and accountability. *** p<0,01; ** p<0,05; * p<0,1.

When the VA variable is used in FE estimation as an independent institutional quality factor, the previous three variables, HEXP, CPI, and DEP maintain the same sign and level of significance as previously observed. HEXP, DEP, and CPI are significant at 10%, 5% and 1% respectively. Life insurance will increase by 5,6 units for every one unit increase in the price level. Life consumption will rise by 17,2 units for every one unit change in health expenditure in the SADC region. DEP contributes to 54,3 units of change for every one unit change. Also, the VA variable is negative and significant at a 5% level. For each one unit change in VA, LIFE will decrease by approximately 291 units. VA has a significant influence on the demand for life insurance in the SADC region. The constant is also negative and significant at a 5% level.

The overall observation is that VA is the only institutional quality variable that has a predictive power on life insurance demand in the SADC region when the FE method is

used for estimation. Under FE estimation, with no other variables in the model, life insurance will be negative, i.e. holding all other variables constant in Model 1, life insurance demand will be -2 588,36 units. The value emanates around -2 500 for most of the models under FE. But when VA is used as an institutional quality variable, holding all else constant, life insurance demand decreases by -3 151, and is significant at a 5% level, contrary to the other models. Table 4.5 provides a snapshot of the results discussed above on significant variables.

Table 4.5: Summary of output statistic results for fixed effect model

Variables	Model: FE	Significance level	Institutional variable used
CPI	Negative	1%	CC
FINDEV	Negative	Not significant	CC/VA
URB	Positive	Not significant	CC/GE/PS/VA
HEXP	Positive	1%	CC/GE/PS/RQ/RL/VA
DEP	Positive	5%	CC/GE/PS/RQ/RL/VA
VA	Negative	5%	VA

4.3.2 Dynamic model estimations: GMM results

GMM introduced by Hansen (1982) makes use of orthogonal conditions to allow for efficient estimation in the presence of heteroskedasticity of unknown forms. Due to high multicollinearity, established in the correlation matrix (Table 4.2), piecewise estimation is deployed by doing the estimation of the model and interchanging the institutional variables.

The advantages of using GMM to estimate the coefficients of the model are many, a few of which include that GMM works to eliminate serial correlation and heteroskedasticity, and cover the endogeneity problem in the estimation of parameters, i.e. the weights matrix is based on a heteroskedasticity and autocorrelation consistent (HAC) estimator. GMM is more efficient when dealing with shorter time periods and more cross-sectional observations.

The advantage of GMM over instrument variable (IV) is that, in the presence of heteroskedasticity, the GMM estimator is more efficient than a simple IV estimator whereas, in the absence of heteroskedasticity, the GMM estimator is no worse

asymptotically than the IV estimator. Casselli et al. (1996) and Bond et al. (2001) show that GMM dynamic panel estimation is capable of correcting for unobserved country heterogeneity, omitted variable bias, measurement error, and endogeneity problems that frequently arise from growth estimations.

The limitation of GMM, on the other hand, is that it does not consider cross-sectional dependency and structural breaks (Baum, Schaffer, & Stillman, 2003). GMM is not a good choice for long panel time-series data. System GMM, developed by Arrellano and Bover (1995) and Blundell and Bond (1998), is considered superior to difference GMM.

System GMM is capable of correcting for unobserved country heterogeneity, omitted variable bias, as well as for time-invariant components of the measurement error. It also corrects endogeneity bias (time-varying component) by instrumenting the explanatory variables. Hence, the dynamic model was estimated using system GMM. Results for one-step GMM are obtained, which uses the identity matrix as the weight. By using one-step GMM, the iteration process will continue until the estimates stabilise.

Table 4.6: Dynamic system GMM estimates

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Variables	**S-GMM**	**S-GMM**	**S-GMM**	**S-GMM**	**S-GMM**	**S-GMM**
Constant	2 562,19	1 439,71	911.843	1,852.07	2,169.20	1,307.36
L.LIFE	-453,954**	-464,045**	-468.512**	-438.568**	-452.623**	-451,119**
CPI	-4,385	-4,694	-4.858	-4.376	-4.806	-4.61
FINDEV	12,34	19,917	20.289	16.206	18.381	20.424
URB	-1,074	-7,8	-10.242	-2.799	-8.864	-6.418
EDUT	-33,743	-41,72	-43.712	-27.467	-36.926	-41.631
HEXP	18,472***	19,403***	19.677***	18.589***	18.898***	19.093***
DEP	-42,329*	-27,584	-20,701	-34,992	-36,052	-27,408
LEXP	28,404	26,595	27,607	27,268	27,459	28,196
CC	-438,449*					
GE		-138,73				
PS			119,536			
RQ				-460,039*		
RL					-339,974	
VA						-174,81
AR1 p-value	0,399	0,413	0,404	0,426	0,415	0,418
AR2 p-value	0,194	0,196	0,188	0,197	0,188	0,195
Sargan p-value	0	0	0	0	0	0
Hansen p-value	1	1	1	1	1	1
instruments	91	91	91	91	91	91
Countries	13	13	13	13	13	13
Observations	94	94	94	94	94	94

Notes. LIFE=Life insurance penetration ratio; DEP=age dependency; INCOME=GDP per capita; CPI=Consumer Price Index; FINDEV=Financial development; URB=Urbanisation; HEXP=Health expenditure; EDUT=Educational attainment; CC=Control of corruption; GE=Government effectiveness; PS=Political stability; RQ=Regulatory quality; RL=Rule of law; VA=Voice and accountability. *** p<0,01; ** p<0,05; * p<0,1.

Table 4.6 reports on the system GMM estimators that use the complete set of linear moment restrictions, implied by the assumptions that the disturbances are serially uncorrelated and that the initial conditions are predetermined. The study obtains very modest improvements on the precisions of the parameters estimate, and there is no evidence from the Sargan test that the AR (1) model is miss-specified for this series. Similar to the FE estimations, the estimated outputs from models 1 to 6 respectively cover stepwise estimations of institutional quality variables, namely CC, GE, PS, RQ, RL, and VA.

Across all models (1 to 6), the lag of the dependent variable (L.LIFE) is negative and significant at a 5% level. The variable indicates that a unit increase in life insurance in the previous period will lead to 454 units decrease in life insurance demand in the current period in the SADC region, and suggests that previous consumption of life insurance reduces current demand. HEXP is positive and significant at a 1% level, hence a unit increase in health expenditure spending will cause an 18,5 unit increase in life insurance consumption. The result obtained here contradicts the hypothesis guidance stated in Chapter 1.3.3. A possible reason for the deviation could be the data sample size and specification bias.

The coefficient of the DEP variable is negative across all models but only significant at 10% in Model 1, which indicates that increases in age dependency reduce life insurance consumption in the SADC region. Higher values of DEP indicate a greater level of age-related dependency in the population. To minimise the economic burden that society faces as age dependency increases, people hedge against the age dependency burden by increasing demand for life insurance. According to the above estimation, it is evident that for every unit increase in the ratio of age dependency, life insurance demand decreases by 42,33 units. This is contrary to the results obtained when the FE estimation approach is used. In Model 1, the institutional quality variable CC is negative and significant at a 10% level. With each unit improvement in CC, LIFE consumption will decrease by 438,45 units. This is abnormal and contrary to people's expectation. In Model 2, GE is used as an institutional variable and has no explanation for life insurance demand in the region.

HEXP is positive and significant at a 10% level in explaining life insurance demand. For each one unit change in health expenditure, life consumption demand is likely to go up by 18,47 units. When using system GMM for estimation and PS as an institutional variable, the following results were obtained. The L.LIFE is negative and significant at a 5% level in explaining the demand for life insurance. For each one increase in L.LIFE, life insurance consumption will decrease by 468,5 units. HEXP is positive and significant at a 10% level. For each unit increase in HEXP, LIFE will rise by 19,7 units. Other variables are not significant. The PS variable is not significant but has a positive sign.

When using system GMM for estimation and RQ as an institutional quality variable, the following results were obtained. In this instance, L.LIFE is negative and significant at a 5% level. Life insurance will decline by 453,95 units for each one unit increase in L.LIFE. HEXP is positive and significant at a 10% level. Life insurance demand will increase by 19,403 units for each one unit change in HEXP. The institutional quality variable itself, RQ, is positive but not significant.

When using system GMM for estimation and RL as an institutional quality variable, the following results were obtained. L.LIFE is negative and significant at a 1% level. Each one unit increase in the previous period for life insurance demand led to 453 units decrease in current life consumption demand. HEXP is positive and significant at a 1% level. For every unit increase in HEXP, life insurance demand increases by 18,90 units in the SADC region.

When using system GMM for estimation and VA as an institutional quality variable, the following results were obtained. L.LIFE is negative and significant at a 1% level. Each one unit increase in the previous period for life insurance demand led to 451 units decrease in current life consumption demand. HEXP is positive and significant at a 1% level. For every unit increase in HEXP, life insurance demand increased by 19,10 units in the SADC region. The coefficient of HEXP has the expected sign and its magnitude is significant under both system GMM and FE. L.LIFE has the expected signs and the magnitude is significant under difference GMM, while the sign is negative and significant when using the system GMM model approach.

Table 4.7 provides a summary of variables that are significant in explaining life insurance demand when the system GMM model is used for estimations.

Table 4.7: Summary of output statistic results for system GMM

Variables	System GMM	Significance level	Institutional variables used
L.LIFE	Negative	5%	CC/GE/PS/RQ/RL/VA
RQ	Negative	10%	RQ
CC	Positive	10%	CC/GE/PS/VA
HEXP	Positive	1%	CC/GE/PS/RQ/RL/VA
DEP	Negative	10%	CC

A cautionary remark will be to note the control of the Sargan test to detect invalid over-identifying restrictions that can decline to immensely infinite samples if an excessive number of moment conditions are used (Bowsher, 2000).

4.4 Sargan / Hansen test for over-identification

The Sargan / Hansen test for over-identifying restrictions is meant to estimate the complete set of parameters. In a model covering huge sets of omitted instruments, such a test may have little power, and additional problems arise when there are reservations on the validity of the subsets of the instruments which will be required to be tested (Baum, 2006). Over-identification in a GMM model relates to a situation where the predictors in the model are one or more instruments. According to Mohd Sidek, Ali, and Ismail (2016), there are two description tests as advised by Arrellano and Bover (1995) and Blundell and Bond, (1998), namely:

- Sargan test for over-identifying limits to test the general validity of instruments; and
- Checks the null hypothesis and error term of differenced equation is not serially correlated at the second order (AR2).

The null hypothesis of both tests should not be rejected, the assumption being that in the second order (AR2) the error term is likely correlated at first order (AR1). The test statistic is dispersed as chi2 with one degree of freedom given the single supplementary instrument; rejection of the test is a signal that at best one instrument is invalid (Hilbe, 2007).

From the estimation, the following results are obtained: Sargan test: chi2 (42) = 51,67, Prob > chi2 = 0,146, the null hypothesis is not rejected. Therefore, instruments chosen are reliable. Hansen test of overidentifying restrictions: chi2 (42) = 0,00, Prob > chi2 = 1,000

Heteroskedasticity is expected to occur as the number of IV increases. Heteroskedasticity can also be attributed to variance and measurement errors. Heteroskedasticity is likely to persist if sub-population differences exist or other interaction effects occur, e.g. the effect of life insurance demand differs for different economies. In the presence of heteroskedasticity, the OLS model is no longer the best linear unbiased estimator, because the error variance is biased.

Breusch-Pagan/Cook-Weisberg (B-P) tests are applied to test heteroskedasticity in a linear regression model. From the estimation obtained: Breusch-Pagan/Cook-Weisberg test for heteroskedasticity gives chi2 (1) = 9,38 and Prob > chi2 = 0,0022. Based on the p-value of the B-P test above, which is less than 5%, it is concluded that there is a substantial amount of heteroskedasticity in the model.

4.5 Income and Demand for life insurance

As discovered in the correlation matrix in Table 4.2, a strong association was found between all other explanatory variables and INCOME. Hence, INCOME was excluded from the prior estimation, although it was included in the empirical model described in Chapter 4. In this section, a model is estimated using the natural logarithm of INCOME as an independent variable, in addition to stepwise usage of the institutional quality variables. All estimations also include time dummies to capture other time-varying factors that impact on life insurance penetration among the sample. In line with prior estimates, the model is estimated using FE and system GMM. The regression results are presented in tables 4.8 and 4.9.

The regression results in Table 4.8 show LIFE as an independent variable and log of INCOME as the only independent variable, using the command area, which allows for suppression of time dummies. It reveals the log of INCOME as positive and insignificant in explaining life insurance demand in the SADC region. For every single

(1) percentage change in INCOME in the SADC region, LIFE will increase by 0,075 units in model two, where GE is used as an institutional variable.

The t-statistics illustrate that log of INCOME is not significant in explaining LIFE at any level. Goodness of fit is 0,035 using adjusted R-square, which accounts for a degree of freedom in computing the role that the explanatory variable plays in explaining the dependent variable. In Model 1, it is observed that for each percentage change in INCOME, LIFE will fall by 0,087 units.

It is only in Model 3 where a percentage change in INCOME results in a 0,084-unit change in LIFE. In all models overall, log of INCOME is insignificant in explaining LIFE. Controlling for time effect, INCOME seems to play no substantial role in demonstrating demand for life insurance.

Table 4.8: Fixed effects

Models	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
Constant	2,936	2,944	1,573	2,890	2,625	2,530
	(2,497)	(2,390)	(2,796)	(2,414)	(2,578)	(2,653)
Ln (INCOME)	-0,087	-0,075	0,084	-0,084	-0,060	-0,052
	(0,330)	(0,317)	(0,389)	(0,332)	(0,348)	(0,361)
CC	0,753					
	(0,706)					
GE		0,930				
		(0,662)				
PS			-0,307			
			(0,218)			
RQ				0,532		
				(0,464)		
RL					0,147	
					(0,367)	
VA						-0,006
						(0,564)
Observations	167	167	167	167	167	167
R-squared	0,035	0,034	0,012	0,016	0,001	0,001
Countries	14	14	14	14	14	14
F	1,118	1,187	1,510	0,663	0,109	0,087

Notes. LIFE=Life insurance penetration ratio; CC=Control of corruption; GE=Government effectiveness; PS=Political stability; RQ=Regulatory quality; RL=Rule of law; VA=Voice and accountability. *** p<0,01; ** p<0,05; * p<0,1.

Using system GMM in estimating the model with log of income and different institutional quality variables being used interchangeably to control for collinearity, the results in Table 4.9 are obtained. None of the variables employed in the model estimation can explain life insurance demand, as they remain insignificant.

Table 4.9: System GMM

VARIABLES	**Model 1**	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**
Constant	0,172	0,173	-0,144	0,046	0,058	0,011
	(0,241)	(0,208)	(0,126)	(0,108)	(0,180)	(0,170)
L.LIFE	0,991***	0,989***	0,997***	0,991***	0,995***	0,991***
	(0,005)	(0,004)	(0,006)	(0,005)	(0,005)	(0,004)
Ln (INCOME)	-0,012	-0,011	0,026	0,005	0,001	0,007
	(0,032)	(0,027)	(0,020)	(0,015)	(0,024)	(0,023)
CC	0,143*					
	(0,070)					
GE		0,132**				
		(0,053)				
PS			-0,011			
			(0,036)			
RQ				0,095***		
				(0,022)		
RL					0,082*	
					(0,040)	
VA						0,090
						(0,053)
Observations	158	158	158	158	158	158
Countries	14	14	14	14	14	14
AR1 p-value	0,094	0,094	0,094	0,096	0,095	0,093
AR2 p-value	0,352	0,350	0,350	0,353	0,352	0,351
Sargan p-value	0,085	0,078	0,079	0,073	0,082	0,080
Hansen p-value	1,000	1,000	1,000	1,000	1,000	1,000

Notes. LIFE=Life insurance penetration ratio; CC=Control of corruption; GE=Government effectiveness; PS=Political stability; RQ=Regulatory quality; RL=Rule of law; VA=Voice and accountability. *** p<0,01; ** p<0,05; * p<0,1.

By using system GMM to estimate the influence of INCOME on LIFE, the results in Table 4.9 were obtained. In Model 1, where CC is used as the only institutional quality variable, L.LIFE is positive and significant at a 1% level in explaining life insurance demand. Every one unit of change from the previous year's life insurance leads to a 0,991-unit increase of current life insurance consumption. CC is also positive and

significant in explaining the demand for life insurance. Every one unit change in CC led to a 0,143-unit increase in LIFE. INCOME remains negative and insignificant.

When GE is used as an institutional quality variable, the following were observed: L.LIFE and GE remain positive and significant. L.LIFE is significant at a 1% level while GE is significant at a 5% level. Every one unit change in GE will lead to a 0,132-unit change in LIFE. A unit change in L.LIFE will lead to a 0.989-unit change in life insurance consumption. INCOME remains negative and insignificant.

When PS is used as an instrument variable for institutional quality, the results for L.LIFE does not change by a large magnitude, but PS is negative and insignificant. LIFE increases by 0,997 units for each one unit increase in L.LIFE. Log of INCOME remains positive but insignificant. When RQ, RL, and VA are used in the estimation, L.LIFE remains positive and significant. The magnitude at which life insurance changes as a result of changes in L.LIFE is around 0,9 units. RL is positive and significant; each unit change in RL will lead to a change in LIFE of 0,095 units. VA is positive but not significant in explaining life insurance consumption. Some but not all of the findings on institutional quality variables are consistent with the study by Ye et al. (2009).

4.6 Conclusion

The overall estimations of LIFE from all models vary in magnitude from model to model. Under the FE model, CPI, HEXP, DEP, and VA (only in Model 6) are the only significant variables that explain life insurance consumption.

For system GMM, L.LIFE, HEXP, and DEP (Model 1) are the only variables that are significant. The institutional quality variables in Table 4.6 identify CC in Model 1 and regulatory quality in Model 4 as having negative and significant levels. In determining the log of INCOME in the demand for life insurance in Table 4.8, the results are insignificant for all variables in the model. Deploying system GMM to determine the log of INCOME on the demand of life insurance, it is observed that L.LIFE is positive and significant, and the institutional quality variables such as CC, GE, RQ, and RL are significant across models in explaining LIFE.

For both FE and system GMM output, it is concluded that the latter is the better model in predicting the demand for life insurance in the SADC region.

Chapter 5:

Conclusions and recommendations

5.1 Introduction

This chapter presents a synopsis of the empirical findings on factors that determine life insurance demand in SADC countries. It covers sections summarising the dissertation, the conclusion from the empirical analysis, the policy recommendations, as well as recommendations for future studies.

5.2 Summary and conclusions

The research objective was to investigate determinants of life insurance penetration in the SADC region. The duration of the estimations ranged from 1995 to 2003, and employed historical cross-country data of 15 SADC member states. The panel data was estimated by two estimation techniques, FE and system GMM. The variables used to estimate the demand for life insurance in the region were macroeconomic and demographic factors.

Under the FE technique, the inflation, health expenditure, and age dependency variables were significant in explaining life insurance penetration in the SADC region. Inflation was positive in explaining the life insurance demand, while financial development was negative and insignificant. Urbanisation was positive but not significant. The health expenditure variable was positive and significant in explaining life insurance consumption.

The results of the system GMM estimation technique show that lag of life insurance was significant and positive; the magnitude of the lag of life was large compared to other variables. The regulatory quality variable was negative and significant in explaining life insurance. Corruption control was negative and significant in explaining life insurance demand. In addition, increases in health expenditure were found to increase life insurance consumption.

Income was found to be insignificant in describing the demand for life insurance. For institutional quality variables under FE, only corruption control was negative and significant, while system GMM results showed that corruption control and regulatory quality variables were negative and significant. The findings regarding inflation contradict the hypothesis of the study; increased inflation levels pushed life insurance demand. These are consistent with the findings of Browne and Kim (1993), Beck and Webb (2003, 2002), and Kjosevski (2012).

In the case of age dependency, the finding of the model satisfies the postulation of the hypothesis, in line with those of Beenstock et al. (1986), Browne and Kim (1993), Zhang and Zhu (2003), Sulaiman et al. (2015), Zerriaa et al. (2017), and Guerineau and Sawadogo (2015).

Variables, such as income, financial development, tertiary education and urbanisation, which were found to have significant influence in the life insurance by numerous studies, are not the predictors of life insurance in SADC region. This could be the result of the sample size or of the un-availability of data for some members states more especially the penetration rate of life insurance. The sample size of the dependent variable (LIFE) is not available for some member states and therefore its impact on the results of the two models cannot be measured.

5.3 Policy recommendations

The findings of this study suggest that variables such as inflation, lag of life insurance penetration, age dependency, health expenditure, corruption control, regulatory quality, government effectiveness, and rule of law are crucial in determining life insurance penetration in the SADC region. The sample scope is sufficiently large, though data quality can be improved over time. The functional form can also be changed. Demand functions are not necessarily linear, as the approaches used seem to assume. The improvements of the mentioned variables are feasible for improving the demand for life insurance in the region. A longer period will also improve the quality of data available across the region and thus improve the estimations.

The SADC region should develop policies that seek to protect and develop the life insurance sector. By advancing variables that influence the demand for life insurance, a policy such as protection of life insurance growth for the region and members states should be developed. This will in turn spur the development of the life insurance sector. As for inflation, the macroeconomic policies need to be restructured in order to stabilise the increase in costs of life insurance and to create an alternative saving mechanism. This will strengthen price stability and upturn the purchasing power of households. The demographic factors have a more robust influence than macroeconomic variables on life insurance consumption in the region.

The significance of health expenditure across models shows that budget for health in the SADC region has increased as the economy develops. It is therefore imperative for policymakers to determine what factors drive the health expenditure budget and whether the increased expenditure on health amenities is reaching the population. The institutional variables in the model underscore the significance of rule of law in the demand for life insurance. Therefore, policymakers should advocate for the protection and enforcement of property rights, which will expand life insurance consumption. Other variables such as corruption control, regulatory quality, and government effectiveness require policymakers to strengthen the quality of the institutions of government.

The SADC region faces many economic challenges, which lead to high unemployment rates. To address these challenges, the CISNA Secretariat must lobby SADC member states to realise the economic benefits that can accrue from the development of the life insurance sector. CISNA should further assist member states (countries with low insurance penetration) with training interventions and technological advancements. This will go a long way, as it will assist members to register all information of the insurance sector as a whole. The Secretariat must provide incentives or recognition for countries that submit their audited life insurance quarterly reports to CISNA.

5.4 Avenues for future research

The research can be expanded through country-specific studies, as often countries have different by-laws that govern the insurance market. There could be other drivers of life insurance demand that are not included here, such as geographical dynamics, drought, or infrastructure presence. These could be included in the model estimations. For further studies on determinants of life insurance consumption in SADC region, the data sample size must be increased to account for all insurance drives in the region.

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