

Demand for non-life insurance: Evidence from select insurance markets in Africa

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TABLE OF CONTENTS

TABLE OF CONTENTS	i
ABSTRACT	iii
ACKNOWLEDGEMENT	iv
LIST OF TABLES	v
LIST OF FIGURES.....	v
GLOSSARY OF TERMS	vi
CHAPTER ONE	1
INTRODUCTION.....	1
1.1 Background of the Study.....	1
1.2 Problem Statement	2
1.3 Research Questions	3
1.4 Significance of the Research	4
CHAPTER TWO.....	7
LITERATURE REVIEW.....	7
2.1 Introduction	7
2.2 Characteristics of the Non-Life Insurance market in Africa	7
2.3 The impact of Macro-economic factors on Non-Life Insurance Demand	24
2.4 The impact of Social factors on Non-Life Insurance Demand.....	29
2.5 The impact of Cultural factors on Non-Life Insurance Demand.....	32
2.6 The impact of Institutional factors on Non-Life Insurance Demand.....	35
2.7 Empirical Literature Review	37
CHAPTER THREE.....	41
RESEARCH METHODOLOGY	41
3.1 Research Approach and Strategy	41
3.2 Research Design.....	41
3.3 Population and Sample.....	47
3.4 Data Analysis and Interpretation	47
3.5 Research Reliability and Validity.....	48
3.6 Assumptions and Limitations of the Study	50
CHAPTER FOUR.....	54
RESEARCH FINDINGS	54

4.1 Introduction	54
4.2 Descriptive Statistics and Correlation Matrix	54
4.3 Correlation Matrix	55
4.3 Regression Results	55
4.4 Summary	59
CHAPTER FIVE.....	60
CONCLUSION AND RECOMMENDATIONS	60
5.1 Introduction	60
5.2 Summary of the findings	60
5.2.1 State of non-life insurance markets in Africa and policy recommendations	60
5.2.2 Determinants of non-life insurance demand in Africa and policy recommendations	64
5.5 Recommendations for further research	66
References	68
APPENDICES.....	62
Appendix A. List of 28 African Countries selected for the study	62
Appendix B. Sources of Data (Definitions & Sources).....	62

ABSTRACT

The impact of insurance market activity within financial development is gaining more attention in academia, as the sector experiences growth within emerging markets. This paper aims to understand which macro-economic and social variables impact the growth or decline of the non-life insurance sector broadly across Africa, with a view to provide recommendations to drive increased penetration across the region. The study examines the explanatory factors of non-life insurance demand in Africa, using annual data from 1990 to 2013 on 28 countries. Using Fixed Effects Panel Data Regression, the study finds that: levels of income, and unemployment rates have a significant negative impact on non-life insurance demand; whilst population growth rates, and the level of private sector credit (to GDP) positively impacted non-life insurance demand. Urbanisation rates, and levels of merchandise trade had statistically insignificant effects on non-life insurance demand. Since these variables only explained about 11 % of the variation in the dependent variable, the study suggests that further research into the cultural and institutional (ie. Legal / regulatory) dynamics is required to improve our understanding of what conditions would stimulate non-life insurance demand in future.

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LIST OF TABLES

Table	Title	Page
1.1	Depth of Insurance Markets across major markets (2014)	13
1.2	Size of the African Insurance Industry in 2014	13
2.1	Characteristics of the Non-life insurance markets in Southern Africa (2013)	18
2.2	Characteristics of the Non-life insurance markets in East Africa (2013)	20
2.3	Characteristics of the Non-life insurance markets in North Africa (2013)	22
2.4	Characteristics of the Non-life insurance markets in Central Africa (2013)	22
2.5	Characteristics of the Non-life insurance markets in West Africa (2013)	26
2.6	Summary of landmark empirical studies on non-life insurance demand	46
3.1	Hypothesised relationships for all variables tested in the study	51
4.1	Summary of Descriptive Statistics	54
4.2	Correlation <i>Matrix</i>	55
4.3	Summary of Internal and External Validity Results	56
4.4	RE and FE Model Results	57

LIST OF FIGURES

Figure	Title	Page
1	Stages of development of insurance markets in selected African countries	28
2	Understanding policy interventions in the non-life insurance sector across Africa	62

GLOSSARY OF TERMS

Insurance density	This indicates the average annual per capita premium within a country expressed in US Dollars. It indicates how much each inhabitants of the country spends on average on insurance. (Outreville F. J., 2013)
Insurance premiums	This is the ratio of direct premiums written to Gross Domestic Product. It shows the relative importance of the insurance sector within national economies and is not affected by currency fluctuations. This measure does however ignore differences in product design, price levels, and other market characteristics, as it is an aggregate figure. (Outreville F. J., 2013)
TPL	Third Party Liability Insurance
MN / BN	Million / Billion
UNCTAD	United Nations Congress on Trade and Development
WC	Worker's Compensation Insurance

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The impact of insurance market activity within financial development is gaining more attention in academia, as the sector experiences growth within emerging markets. In the past decade (1995 to 2015), the contribution of the insurance sector in Africa has doubled, however, the demand remains well below the global averages (Swiss Re , 2015). There is a need for policy makers and industry players to consider and motivate for the appropriate conditions for insurance demand to thrive on the continent. Theoretical arguments for the relevance of insurance within the finance-growth nexus were identified as early on as 1964 at UNCTAD's First Conference on Trade and Development in Geneva. It was noted that "a sound national insurance and reinsurance market is essential for economic growth" (UNCTAD, 1964). Insurance companies play a significant role as "financial intermediaries that increase savings in an economy (and) risk managers that allow businesses and individuals to transfer potential losses" (Liedtke, 2007). The sector, therefore, improves financial systems by: "promoting financial stability (through risk transfer, managing and diversifying risk); lowering the costs of potential investments (by protecting companies against financial losses); mobilising domestic savings (through collecting premiums and reinvesting them long term within an economy); and facilitating trade and commerce" by de-risking the cost that could be incurred in cross-border trade (Arena, 2008, p. 923). For individuals, non-life insurance products provide access to financial markets that they typically would have otherwise not been able to, since banks can now "transfer credit risk (for the purchase of certain assets) to insurance providers through the securitisation of their credit portfolios" enabling them to lend to higher risk profiles (Arena, 2008, p. 925). Furthermore, insurance companies also provide massive job creation benefits, owing to the complexity of their operations.

This study considers the nature and determinants of non-life insurance demand across African countries. It identifies the current status quo of non-life insurance across sub-regional markets with a view to understand the conditions under which a mature market can be developed. By considering the socio-economic factors that influence non-life insurance demand, we will provide new insights into the potential barriers to insurance development growth across the continent. From 1990 to date, much work on determinants of non-life insurance demand has

been researched in Latin or Asian emerging markets (Garcia, 2012); (Ma & Pope, 2003); (Stojic & Njegomir, 2012), with less focus on the African region. This paper turns its focus to exploring these dynamics for select African markets, with a view to be the first published contribution to the body of knowledge to cover this gap in the research. Whilst further research into the cultural and regulatory barriers on non-life insurance demand needs to be attended to, with the current data limitations these aspects have been held constant for the purposes of this empirical study. We do strongly recommend that future studies into the dynamics of the non-life sector in Africa, take these factors into account. This chapter is dedicated to identifying the current knowledge gap with respect to non-life insurance, and explaining the significance of this area of study. It will outline in greater detail what the study will address, and explain the theoretical structure and empirical analysis to be undertaken in the study.

1.2 Problem Statement

1.2.1 Identifying the Knowledge Gap

The primary knowledge gap this paper will address is understanding which macro-economic and social variables impact the growth or decline of the non-life insurance sector broadly across Africa. In the early 1908s, the insurance sector was initially established through foreign companies setting up regional offices on the continent; until government-sponsored local insurance companies were established. At that stage, the primary inhibitors to the growth in insurance products included a narrow economic base, due to the “prevalence of a subsistence economy and the existence of limited and commercial sectors (in addition to) inadequate regulatory frameworks” (UNCTAD, 1985, p. 222). However, with the structural adjustment programs enacted by most post-independent economies across Africa driving commercial and economic growth, whether the same limitations exist has not been verified.

Most African economies in 2015 were growing at an average of 4.5 % of GDP in 2015 with a projected 5% GDP growth for the region in 2016 (Wall Street Journal , 2015). With the ease of doing business improving, a burgeoning middle class demanding more products, coupled with a robust and growing youth population; Africa is a continent with positive investment opportunities and long-term growth prospects for investors globally. However, investors cannot fully capitalise on these opportunities, unless they know that should their investment be compromised by common unexpected loss, they can recoup their investment to some extent. Concurrently individuals who are benefiting from the improved growth projections (and

therefore disposable income increments) cannot purchase certain assets that would improve their standard of living, without knowing that they are also covered from damage and/or loss. The cost of investing in Africa is still vague to some extent, and without creative insurance products corporates, and individuals cannot cover these costs. Furthermore, non-life insurance has a direct link to commercial and economic growth, that more broadly results in improved levels of economic development at a macro-economic level for all communities.

Whilst these limitations are known, the drivers to encourage more diverse non-life insurance products and the demand thereof are less understood. Furthermore, whether the same or other inhibitors now affect the sector today remains understudied. This study aims to address these limitations by identifying the key macro-economic and social factors that influence non-life insurance demand across Africa to date. By assessing the evolution of the sector from 1990 – 2013, it will empirically ascertain which factors are most relevant to driving demand for these products. The emphasis is placed on non-life insurance since it is more widely represented geographically. More than 65% of the African market is dominated by non-life insurance products except for South Africa. Overall premiums contributing to only 33% of total insurance premiums on the continent, with 56.9% of the remaining premiums dominated by the South African life market. Due to lack of data, the paper cannot consider these dynamics per product line, however this would be an additional area of research that would be highly beneficial to corporates and the insurance sector more broadly. Recent studies on African insurance markets have focused more on South Africa's life insurance market or proving the relationship between economic growth and non-life insurance demand on the continent (Akinlo & Olayungbo, 2016) (Akinlo & Apansile, 2014). And to my knowledge, no academic work has exclusively researched what characteristics significantly determine non-life insurance demand in Africa.

1.3 Research Questions

In line with the problem statement, research objectives and purpose of study provided above, the following research questions have been designed to respond to the knowledge gap this paper will contribute to:

- i. What is the current state of the non-life insurance market in Africa?*

- ii. What effect do macro-economic and social factors have on non-life insurance demand in Africa?*

H₀: macro-economic and social factors have no effect on non-life insurance demand in Africa

H₁: macro-economic and social factors significantly affect non-life insurance demand in Africa

1.3.1. Research Objectives

In line with the research question summarised above, this study seeks to review and evaluate the market dynamics of the non-life insurance markets identified in this study.

- I. To review the market dynamics of the non-life insurance markets identified in this study
- II. To examine the impact of macro-economic and/or factors on non-life insurance demand

1.4 Significance of the Research

Life versus Non-Life Insurance

The key landmark study considering a regional analysis of the continent was in May 2016; this landmark study on the explanatory factors of life insurance demand in Africa found that “income, inflation, dependency ratio and life expectancy lead to decline in life insurance consumption, [whilst] financial development, health expenditure and institutional quality were found to positively impact on life insurance consumption in Africa” (Alhassan & Biekpe, *Determinants of Life Insurance Consumption in Africa*, 2016). Alternatively, research has been focused on the relationship between economic growth and insurance demand on the continent. Most recently, a study on eight African markets considered the causal relationship between insurance penetration and economic growth, finding “that long-run relationships exist between insurance market activities and economic growth for Kenya, Mauritius, Morocco, Nigeria and South Africa” (Alhassan & Biekpe, 2016). These studies are the only ones to take a regional view of the African insurance sector. However, their relevance to the continent is distant; of the life insurance premiums (totalling USD 49,9 billion) in Africa in 2012, 89.9% of this has been dominated by South Africa. Therefore, studies on Africa’s insurance sector have typically focused on South Africa and steered towards understanding the life insurance market. A review of the top 7 insurance markets on the continent in 2012, showed that more than 65% of the market is dominated by non-life insurance products, except for the South African market (A. M. Best Company, 2014). Continentally, therefore, it would be more relevant to consider the determinants of non-life insurance demand which accounts for the remaining USD 22 billion

in premiums, as this is more widely represented geographically. In 2012 life penetration rate (excluding South Africa) sits at 0.31 % whilst non-life insurance penetration rate was slightly more popular at 0.73% on the continent (KPMG, 2012). Despite this, there appears to be a significant gap in the body of literature, for empirical research into the non-life market for Africa.

Significance of the Non-Life Market

With the “continent’s GDP predicted to double by 2035 (and) the population expected to reach 2.5 billion over the next thirty years” (Bizcommunity, 2016) there is a potential for substantial growth in non-life insurance demand on the continent, as corporates and individuals requirements for protection from potential future losses or damage rises with increased investment activity. The dissertation research aims to review and identify the factors that are correlated with increased demand for non-life products in selected markets on the continent. The lack of development of non-life insurance demand in Africa despite rapid projected growth rates is a concern for commercial and economic growth. Despite insurance per capita rates for Africa having almost doubled in a decade from 1.7% in 1995 to 2.7% in 2015, this was still significantly less than half the global average of 6.3% (Swiss Re, 2015). With the continent, having contributed to 6.3 % of the world’s GDP and higher projected growth projections than developed markets, these inconsistencies not only point to inadequate supply of insurance products but also to a high potential that commercial ventures are inadequately covered for potential losses and consequently massive capital reserves are required for investment. (World Bank, 2015). These undercut local/regional players who cannot afford the high unsecured capital outlays required to enter new business ventures. A market where this is depicted is the Nigerian market, which is one of the Africa’s fastest growing and second largest economy on the continent, despite a 0.2 % insurance penetration rate in 2015 (Swiss Re, 2015). Only global corporates with excess capital reserves or parastatal entities backed by public sector funds to contribute to commercial growth. In a market like this, it is crucial for policy makers to understand how local players can access insurance products, so the economy can broaden their participation and reduce capital flight. Any external shocks (eg. interest rates, foreign exchange rates or oil prices) significantly affect the Nigerian economy because global companies dominate their markets.

Another concern is the imbalance of the absorption of non-life products across the region; 71% of total premiums (and 40% of non-life premiums) across Africa in 2014 were concentrated in

South Africa, resulting in most global players investing in long term medium risk opportunities the country (Swiss Re , 2015).¹ The stability of these global player's investment in South Africa, enables the economic policy makers to develop clear strategies in the medium to long term that would complement the overall growth of the economy. The uneven distribution of non-life insurance results in business opportunities within other African markets remaining untapped as corporates' requirements for protection from potential future losses remains unmet. It is crucial therefore, for other African countries to reassess their insurance sectors and understand the conditions for a growing sector as an important driver of economic growth. Finally, insurance companies also play a further role as institutional investors, providing necessary debt and equity financing in their economies. Based on the above, there is a case for exploring the market dynamics of the non-life insurance sector across Africa.

1.5 Organization of the study

This study will be organized into five chapters. Chapter 1 has introduced the study and defined the scope of analysis to be covered as well as the relevance of this paper to the broader body of knowledge within insurance risk management. Chapter 2 will critically review the current state of the sector across Africa, in addition to assessing the key factors that have been identified to impact non-life insurance demand to date². Chapter 3 will then, outline the key research tools and methodology employed in this paper to identify valid socio-economic variables that could influence non-life insurance demand, with Chapter 4 presenting the findings of the study in greater detail. Chapter 5 will review these findings, in line with the current state of the sector and suggest recommendations for policy makers, governments and insurance companies regarding the African market. Furthermore, it will conclude and suggest areas for further research into the insurance market dynamics for Africa.

¹ See [Table 1.2 Size of the African Insurance Industry in 2014](#)

² Note: non-life insurance in this paper does not include forms of healthcare insurance in this study. Additionally, the study only focuses on determinants of non-life insurance and at no point considers those of life insurance.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter provides an overview of the non-life insurance market in Africa and a detailed review of the literature on the impact of macroeconomic, social, cultural and regulatory factors on non-life insurance demand globally. Section 2.2 outlines some stylised facts about insurance markets across Africa, with a focus on the countries included in this study. The rest of the literature review (Section 2.3) identifies and critically analyses the relevance of several economic, social, cultural and institutional variables that have been studied previously in determining what drives non-life insurance demand in other developed and emerging markets.

2.2 Characteristics of the Non-Life Insurance market in Africa

The insurance sector in Africa, though it has a significant role to play and exhibits massive growth potential, is substantially behind other global markets. Table 1.1 shows a global comparison of the African insurance market to other emerging market players and the top advanced markets which contribute to the sector. This comparison by region reveals that Africa is substantially below the global average penetration rate of 6.2%, with less than half the penetration rate as a region at 2.8 % in 2015 (SwissRe, 2015). Whilst the continent still has much room for growth, it performs favourably compared to other emerging markets (such as Central & Eastern Europe, and Emerging Asia). “The attraction of Africa’s insurance market lies in countries with large, growing populations and strengthening economies where the general market is relatively untapped among consumers” (A. M. Best Company, 2014).

Table 1.1 Depth of Insurance Markets across major markets (2014)

	Total Premiums (US\$ Billion)	Non-life Premiums (US\$ Billion)	Penetration Rate (%)	Insurance density (Premiums/capita)
Advanced Markets	3939	1707	8.2	3666
United States	1280	752	7.3	4017
Japan	480	108	10.8	3778
United Kingdom	351	116	10.6	4823
France	271	98	9.1	3902
Germany	251	136	6.5	3054
Italy	195	49	8.6	3078
South Korea	160	58	11.3	3163
Emerging Markets	839	417	2.7	136
Latin America & Caribbean	188	113	3.1	304
Central & Eastern Europe	70	50	1.9	218
Emerging Asia	466	190	3.1	126
Middle East & Central Asia	49	37	1.6	142
Africa	69	23	2.8	61
World	4778	2124	6.2	662

Source: Adapted from "Development in the major insurance markets in 2014" (SwissRe, 2015)

Table 1.2 highlights these statistics, in addition to the overall size of the African Insurance industry. Of the top ten markets in the region, five (South Africa, Morocco, Kenya, Namibia & Mauritius) already have total insurance penetration rates well above the continental average, with non-life products dominating in seven of the top ten markets (all but South Africa, Namibia and Mauritius which are also considered the most mature markets on the continent both from a financial and economic development perspective). In terms of insurance penetration, Kenya and Morocco are considered comparable to other developed markets, whilst Nigeria and Egypt are under-insured.

Table 1.2 Size of the African Insurance Industry in 2014

Country	Total Premiums (US\$ Millions)	Non-life Premiums GDP (US\$ Millions)	Total Penetration Rate (%)	Non-life Penetration Rate (%)	Total Insurance Density (Premiums per capita, US\$)	Non-life Insurance Density (Premiums per capita, US\$)
South Africa	49 159	9375	14.0	2.7	925	176
Morocco	3 400	2257	3.2	2.1	102	67
Egypt	1 968	1079	0.7	0.4	24	13
Nigeria	1 790	1332	0.3	0.2	10	7
Kenya	1 784	1152	2.9	1.5	39	25
Algeria	1 597	1492	0.7	0.7	40	37
Angola	1 142	1110	0.8	0.8	52	50
Namibia	931	283	7.2	2.2	396	120
Tunisia	888	748	1.8	1.5	80	67
Mauritius	766	244	6.0	1.9	613	196
Other	5 549	4105	-	-	-	-
Total	68974	23178	2.8	0.2	61	21

Source: Adapted from the statistical appendices of the "World Insurance in 2014: back to life" report (Swiss Re , 2015)

The rest of Africa has historically had a very low demand for insurance, with several initiatives arising to promote the industry, including: "recapitalization of insurance companies, organic consolidation, educating consumers, the establishment of insurance protection funds, improved distribution channels and stronger reporting and regulations." (A. M. Best Company , 2014, p. 4) On the regulatory side, several challenges still exist including: "lack of access to information across countries, poor harmonisation of regulatory supervision, licensing and claims processes...A positive signal that the sector is growing is that "in 2013, total African insurance premiums by volume grew by more than 10%" - outpacing the continent's GDP growth which stood at 6% for that year (Schanz & Company, 2015).

Regional Analysis of Africa's Non-Life Insurance Markets

This section will provide a review of the established insurance markets on the continent with a view to ground the study on which variables to place emphasis on when considering the determinants of non-life insurance demand, and empirically test further in the study. By understanding the history, economic and social dynamics of these markets, one can select which determinants would likely be relevant to the continents non-life market.

1.5.1 Southern Africa

South Africa

South Africa is the largest insurance market on the continent accounting for USD 54,9 billion (76.4%) of Africa's total insurance premiums in 2012. The country had a penetration rate of 14.2%, and "despite weakening economic environment in 2014 resulting in a 0.02% dip in penetration rate, non-life premium rose by 2.5%" (Swiss Re, 2015) (Swiss Re, 2016). As at 2013, South Africa had 96 domestic non-life insurance business, 74 domestic life insurance businesses and 4 composite businesses (Schanz & Company, 2015). Many of the larger players in the South African market are leading the way in terms of market penetration on the continent. Businesses such as Old Mutual, Sanlam Emerging markets and Hollard Insurance are setting up subsidiary businesses regionally and there is scope to investigate what determinants contribute to attractive markets for regional insurers to tap into other African markets. The minimum capital requirement is ZAR 10 million (with the total amount as paid up share capital); additionally, the sector is fully privatised with stock companies as the allowed ownership structure (Schanz & Company, 2015). Bancassurance further strengthens the sectors ability to proactively target potential customers in the country.

Botswana

Botswana is one of the few insurance markets with a life insurance market approximately double the size of the non-life market. The country has the fourth largest penetration rate in Africa. Although small in absolute terms, this is one of the more advanced insurance markets in Africa, with a penetration rate well above 3% since 2005. In 2012, the market consisted of 12 general (non-life) insurance companies, 7 life insurance companies, and 42 insurance brokers, per the Non-Bank Financial Institutions Regulatory Authority (KPMG, 2012, p. 6). The company. Most of the premiums for the non-life market, however, are still in rudimentary policies such as fire and car insurance, and four companies account for 75% of the premiums in the non-life market. In 2012, the four largest companies by written premiums were Botswana Insurance Company (BIC, accounting for 24.7% of the total), Zurich (21%), Regent (16.8%), and Mutual & Federal (12.4%) (KPMG, 2012, p. 7). Botswana has set minimum capital requirements at USD100,000 to USD 500,000 depending on the size of gross premiums to be underwritten, with the paid-up share capital requirement established on a case by case basis through the Ministry of Finance (Schanz & Company, 2015).

Mauritius

Mauritius is also among the most developed insurance markets in Africa, with a penetration rate above 3% since 1990, and now at 5.5% as at 2015 (Swiss Re, 2016). The life market is more than double the size of the non-life market, “thanks to a relatively high level of income, macroeconomic stability, an established financial sector, a business-friendly investment climate, and good economic policy making” (KPMG, 2012, p. 7). The country as at 2013 had 6 life insurance providers and 13 licensed non-life insurance companies (Schanz & Company, 2015). Despite the size of the market relative to GDP and population being impressive, the maturity of the market is similar to other African markets. “Apart from life products, motor and property insurances lines are the principal product lines. Car insurance is the largest component in the non-life insurance segment, accounting for 43.6% of premiums in 2012” (KPMG, 2012). The market is supported by the fact that car insurance is mandatory. Minimum capital requirements are MUR 25 million as paid-up share capital.

Mozambique

Mozambique’s insurance market is marked as one with high potential since its penetration rate of 1.3% is massively unrepresentative of the country’s population. Since the economy has been disrupted post-independence with many bouts of civil unrest, the economy has not grown excessively in from 1990 to 2016, relative to other countries within the region. Thus, without macroeconomic stability, the sector has struggled to actively take steps towards rapid growth. The market is still dominated by the non-life market which accounts for 84% of gross written premiums as at 2013 (Swiss Re, 2016). Whilst regulatory frameworks and bodies are in place to oversee the operations and growth of the insurance sector, mostly foreign companies have dominated the market with several South African players having tapped into the market through acquiring local companies (e.g. Sanlam, Absa Insurance company, Hollard Insurance International). As at 2012, there were 3 domestic life insurers, 2 domestic non-life insurers and 13 foreign composite insurers in the country (Schanz & Company, 2015). Companies can either be stock or mutual companies, with a minimum capital requirement of MZN33 – 67 million (Schanz & Company, 2015). An increasing middle-class population life expectancy rate and mandatory lines of insurance such as motor third-party insurance and aviation liability insurance were the key factors for overall insurance industry’s growth (Fast Market Research, 2016).

Namibia

There are approximately 28 insurance companies in Namibia, with 16 of them being life companies which accounted for 74% of gross written premiums in 2012. 12 are domestic non-life insurance companies whose primary focus has been on retail insurance - with the market being dominated by South African insurance companies (Old Mutual, SWABOU, Santam, Hollard and Lloyd's SA). Namibia's insurance penetration rate of 7.6% as at 2012, is amongst the highest on the continent, however the market is still riddled with its own growth challenges, including low financial literacy and over-reliance on South African companies to drive growth, since "until independence financial institutions in Namibia were regulated under the appropriate South African legislation and the Namibian regulation is, therefore, closely related to the South African counterpart" (Bester, Chamberlain, Hawthorne, Malherbe, & Walker, 2004). The country has set minimum capital requirements at N\$1 – 4 MN which does not have to be in the form of paid-up share capital.

Madagascar

Madagascar is a nascent insurance market on the continent, with penetration rates below 1% (at 0.6% in 2013) of GDP in 2013. The country has made headway in defining an appropriate regulatory framework for the sector to thrive; being the first to introduce a risk-based capital framework to reflect the economic impact of balance sheet risks - ensuring regulatory and supervisory bodies ensure insurers have adequate resources to avoid insolvency and manage financial or external shocks (Schanz & Company, 2015). They have also established a guarantee/policy holder protection fund, to assure their customer base of stability in the sector, through appropriate measures for claims to be paid out. Minimum capital requirement (which can act as a barrier to entry for new insurance companies) are MAG60 MN – MAG1BN (Schanz & Company, 2015).

Zambia

Zambia's insurance market is massively underdeveloped, relative the level of their economy. Its penetration rate has declined from 1.6% in 1990 to 1.3% in 2013, despite GDP per capita almost tripling in the same period. The sector consisted of 23 insurance companies as of October 2013, of which 8 were life insurers and 15 provided non-life insurance (KPMG, 2012). However, most companies remain small and massively undercapitalised. Minimum capital requirements have been set at USD200,000 as at 2013 (Schanz & Company, 2015). There is massive potential for this sector to grow within this country and new entrants into the market

(particularly from South Africa) are looking to tap into this market – both in terms of bancassurance and foreign companies (such as Hollard Insurance International) entering the country. As in many other African countries, a challenge for insurance companies in Zambia is to raise the public’s awareness and appreciation of the importance of insurance, as well as their confidence in the system (KPMG, 2012). This has been noted as crucial particularly with the agricultural sector which is the primary driver of economic growth and GDP increase in the country.

Table 2.1: Characteristics of the Non-life insurance markets in Southern Africa (2013)

	<i>Penetration rate (2013)</i>	<i>Non-life penetration rate</i>	<i>Number of Non-Life firms</i>	<i>Minimum Capital</i>	<i>Short-term Business Lines</i>
<i>South Africa</i>	13.9%	1.8%	96 (plus 4 composites)	ZAR 10 MN	TPL*, Fire, Property liability, Motor, WC*
<i>Botswana (2012)</i>	3.3%	1.0%	12	USD 100,000 – USD 500,000	Fire, Motor*, WC*
<i>Mauritius</i>	5.9%	1.8%	13	MUR 25 MN	Motor*, Property
<i>Mozambique (2012)</i>	1.3%	1.1%	8 (with 2 domestic non-life included)	MZN 33 MN – MZN 67 MN	Fire, Motor*, TPL*, WC*
<i>Namibia</i>	7.6%	1.9%	17 (with 12 domestic included)	N\$1 MN – N\$ 4MN	Retail, Motor*, TPL*
<i>Madagascar</i>	0.6%	0.5%	3 (composite domestic) and 2 (foreign composite)	MAG 600 MN – MAG 1BN	-
<i>Zambia</i>	1.3%	0.9%	15 (10 domestic, 5 foreign)	USD200,00	Motor*, Aviation*, TPL*

Source: African Insurance Regulation Directory (Schanz & Company, 2015), World Insurance in 2014: back to life (Swiss Re , 2015). Note: * denotes a compulsory product line by law

1.5.2 East Africa

Kenya

Kenya’s insurance penetration rate was 2.8% in 2013 which was relatively higher than most regional markets, but the maturity of the market still lagged the country’s growth rate, when in most African countries insurance growth has outpaced economic growth. Almost 41% of the non-life insurance market is made up of car insurance, 22.1% medical and 10% fire insurance. In 2013, there were 49 licensed insurance companies in the country (Insurance Regulatory Authority Kenya , 2013). The overall efficiency of the insurance market is substantially high, owing to strong capacity for innovation in the country – shown in ability to offer products to the non-banked through M-Pesa. Harnessing technology for insurance has also improved claims processes through the country’s ability to capitalize on mobile technology to improve the efficiency of payment processes. (KPMG, 2012, pp. 7-8) The industry is also leveraging mobile

technology to tap into lower ends of the market, promote the image of insurers, and educate customers about their products. Minimum capital requirements have been set at KSH 100 – 500 MN, at 100 % paid up capital share (Schanz & Company, 2015). These are all the right moves to growth the sector for individual lines, however much less has been done for commercial lines which still slowed growth in 2014 by 5.2% (Swiss Re, 2016, p. 34).

Ethiopia

The Ethiopian insurance market was first established on a bancassurance model with the Bank of Abyssinia in 1905 and gained prominence between the 1920's – 1960's when foreign insurance businesses entered the country. Non-life products such as fire and marine policies were the first to be established in the market. In 1951 the first domestic insurance company was established, Imperial Insurance Company, together with 33 foreign companies who were doing business in Ethiopia (Tadesse, 2015). In 1970 the first regulatory framework was established (the Insurance Proclamation) with an Insurance Controller appointed to “regulate the conditions for establishing an insurance business (a key requirement being 51% national ownership), the capital requirements, statutory deposit requirements and conditions for appointing insurance brokers and agents” which resulted in a mass exit of foreign players in the market (Zelege, 2007). From December 1970, the Ethiopian Insurance Corporation (EIC) was established and the assets and liabilities of the 13 insurance providers at the time was transferred over to 1 entity and a monopoly market was established in Ethiopia. “International insurers are still not allowed to conduct business in Ethiopia” which explains the below 1% penetration rates in the country to date (Tadesse, 2015). There were 17 state owned insurance providers as at 2013 - 8 of the are domestic non-life insurers - and whilst promises of an open market economy have been reiterated no liberalization of the sector in the country has ensued since (Schanz & Company, 2015). Minimum capital requirements have been set at ETB 15 – 500 million.

Tanzania

“In 1996, the Insurance Act liberalised Tanzania’s insurance market paving the way for private new entrants to the market; until then a monopoly was held by the government’s National Insurance Corporation. These changes successfully attracted foreign and domestic investment to the Tanzanian insurance sector. Most companies are partnerships between foreign companies and local investors, market expertise” (Tanzania Invest, 2014). As at 2013, Tanzania possessed 27 insurance companies, 7 of which were domestic companies in the non-life sector with a

primary focus on marine products as the source of gross written premiums. 23 represent privately owned insurance companies with at least one-third Tanzania citizen ownership, 2 companies are 100% state owned by the Governments of Tanzania and Zanzibar, and 5 companies are 100% owned by Tanzanians (Tanzania Invest, 2014). Despite these moves, the Tanzanian insurance market is still underserved, with a premium per capita of only US\$5,7 (at a 0.6% penetration rate) of the US\$957 GDP per capita as at 2015 (SwissRe, 2015). The non-life market accounts for nearly 90% of gross written premiums, and whilst the market holds a lot of potential for growth, however several strategies and structural changes have been advanced to encourage growth. These include: targeting or developing products that will appeal to the growing youth population (more than 50% of the population is under 25); finding ways to combat cultural barriers that result in distrust of insurance products and reducing insurance fraud (insurance fraud was estimated to add 31% to the cost of premiums in 2015); and developing the Takaful insurance products since the country is dominated by the Muslim population (Norman, 2015).

Table 2.2: Characteristics of the Non-life insurance markets in East Africa (2013)

	<i>Penetration rate</i>	<i>Non-life penetration rate</i>	<i>Number of non-life firms</i>	<i>Minimum Capital</i>	<i>Short-term Business Lines</i>
<i>Kenya</i>	2.8%	1.6%	24 domestic (11 foreign composite firms)	KSH 150 MN – KSH 500 MN	Motor*, TPL*, Aviation*, WC*, Fire, Medical
<i>Ethiopia</i>	0.53%	0.49%	8	ETB 15 – ETB 500 MN	Fire, Marine
<i>Tanzania</i>	0.8%	0.7%	27	TZS 1.5 BN – TZS 5 BN	Takaful, Marine

Source: African Insurance Regulation Directory (Schanz & Company, 2015), World Insurance in 2014: back to life (Swiss Re, 2015). Note: * denotes a compulsory product line by law

2.2.3 North Africa

Morocco

Takaful products are the dominant form of insurance provided in the Moroccan market. This product is a variation of traditional commercial insurance products; whose investment and claims strategy is in line with Islamic finance guidelines. As at 2012, there were “17 insurance companies in the country, with total premiums USD 2, 86 billion and a penetration rate of 2, 97%” (Ncuba). The country is one of the few that benefits from global players in its market, and is also aggressive about expansion of its local players outside of Africa. The 4 largest

companies³ dominate 70% of the market, so despite openness to foreign investment, the country largely emphasizes a localized ownership strategy. The product variability is also still substantially low, with “47% of non-life insurance premiums being for car insurance” (KPMG, 2012, p. 10). There is a growing life insurance market which accounts for 42.6% of total premiums. (A. M. Best Company , 2014, p. 3). Moroccan companies are among the most aggressive of all the African countries in expanding operations overseas in West Africa⁴.

Egypt

In absolute terms, Egypt’s total premiums are the 4th largest on the continent, however its penetration rate reflects the underdevelopment of the market at 0.68% in 2012. (KPMG, 2012, p. 2) It is likely that the leading reason for low insurance demand in Egypt is religious, with approximately 90% of the population being Muslim.

Algeria

Algeria’s insurance premium continues to grow steadily, from USD 1,25 billion (as at 2012) to USD 1, 57 billion in 2014. For similar reasons to Egypt however, the country has an underdevelopment insurance market, with a penetration rate of only 0.6% as at 2012 (KPMG, 2012, p. 2).

Libya

Libya’s insurance market has progressively declined from 0.6% in 1993 to nearly 0.2% in 2012, amidst fluctuating GDP growth and recessions over the period. Only four known companies operate in the Libyan market, including: Libya Insurance Company, Sahara Insurance Company, Trust Insurance Company and United Company for Insurance – which all provide non-life products to the market. A core focus on aviation, maritime, fire and motor insurance products dominate the market (AECI, 2016).

³ These include: Wafa, RMA Watanya, Axa Assurance Maroc & CNIA Saada

⁴ In West Africa, they were expanding across Ivory Coast and Tunisia

Tunisia

Although insurance penetration levels in Tunisia are low by international standards, overall premiums are growing steadily and the life segment is expanding rapidly, as are new niches such as Takaful and micro insurance (Oxford Business Group, 2016).

Table 2.3: Characteristics of the Non-life insurance markets in North Africa (2013)

	<i>Penetration rate S</i>	<i>Non-life penetration rate</i>	<i>Number of Non-Life Firms</i>	<i>Minimum Capital</i>	<i>Short term Business Lines</i>
<i>Morocco</i>	2.7%	1.7%	9	MAD 50 MN	Takaful, TPL*, Motor*, WC*, Decennial liability*
<i>Egypt</i>	0.7%	0.4%	19	EGP 60 MN	Takaful, TPL*, Motor*
<i>Algeria</i>	0.6%	0.59%	13 (plus 4 foreign composite)	DA 1 BN – DA 5 BN	Motor*, TPL*, Natural Catastrophe*, Decennial liability*
<i>Libya</i>	0.3%	0.25%	11	USD 8 MN – USD 24 MN	-
<i>Tunisia</i>	1.8%	1.5%	19 domestic composite	TND 10 MN	Motor*, TPL*, Decennial liability

Source: African Insurance Regulation Directory (Schanz & Company, 2015), World Insurance in 2014: back to life (Swiss Re , 2015). Note: * denotes a compulsory product line by law

2.2.4 Central Africa

Angola

Angola’s “restrictive legal policies, unstable macroeconomic environments and shortage of skilled workers have held back development of the sector.” The penetration rate sits below 1% and whilst the government started to enforce compulsory in 2010, this was only acted upon in 2013. For businesses with a higher risk appetite (such as the Sahaam Group which recently acquired a local player Global Alliance) the Angolan market has substantial potential for growth.

Table 2.4: Characteristics of the Non-life insurance markets in Central Africa (2013)

	<i>Penetration rate (2011)</i>	<i>Non-life penetration rate (2011)</i>	<i>Number of Firms</i>	<i>Minimum Capital</i>	<i>Number of Business Lines</i>
<i>Angola</i>	0.6%	0.55%	18 composite	USD 10 MN	Motor*, TPL*, WC*, Aviation*

Source: African Insurance Regulation Directory (Schanz & Company, 2015), World Insurance in 2014: back to life (Swiss Re , 2015). Note: * denotes a compulsory product line by law

2.2.5 West Africa

Benin

The insurance sector in Benin has both general and life insurance product lines, with the non-life market outperforming the life market. The industry however is underdeveloped, having achieved less than 1% penetration rate as at 2012, with decline in growth from 2011 to 2012. Damage related insurance products are the primary form of non-life lines available. As at 2008, there were 12 insurance companies in Benin: 5 in the non-life market⁵ and 7 in the Life insurance space⁶. Benin's economy (and insurance market) is underdeveloped relative to its neighbour market Nigeria; the country relies primarily on subsistence farming of cotton and re-export activities (of products from Nigeria) for economic growth. These macroeconomic factors are a likely stumbling block to the growth of financial development in the country. "Real gross domestic product (GDP) growth is projected to drop to 4.6% in 2016, and decelerated by 5% in 2015 due to decreased cotton production which represents 5% of GDP and 27% of exports" (World Bank, 2016). With these projections, there is little room for demand-led insurance growth, and this is reflected not only in the low insurance penetration rates, but also in the "very low bank penetration rate of 7 %" (UNCDF, 2014).

Cameroon

The insurance sector in Cameroon, forms less than 1% of GDP, with the non-life market steadily declining between 2010 to 2012. Most policies are subscribed by industrial or commercial companies, except for motor vehicle cover insurance which cuts across commercial and personal product lines. Motor vehicle insurance is a primary product line and "although it is a legal requirement, it is estimated that only 50% of the cars are insured in Cameroon. [It has been noted that] effective enforcement of existing laws would contribute towards the development of the insurance sector and through" (Kouassi, Akpapuna, & Soededje). Life insurance is on the rise, representing approximately 30% of the market however, growth remains largely unpredictable and slow.

Cape Verde

Prior to 1990 the sector was monopolized by government. "In 1990, this entity was privatized to become Garantia, one of the two insurance companies currently operating in Cape

⁵ The Non-Life insurance companies include: Africaine des Assurances, NSIA Benin, FEDAS, GAB, AGF-BENIN and SAARB

⁶ The life insurance companies include: UBA VIE, ARGG, COLINA VIE BENIN, AVIE, NSIA VIE BENIN, SADES and AFRICAINE-VIE

Verde. Motor insurance represents the largest segment of insurance business conducted in Cape Verde, accounting for approximately 50 percent of annual premium income” (Wharton Financial Institutions Centre, 2016) Other significant segments of the insurance market include accident, fire, construction, maritime, transport, and civil liability. Pure life insurance represents a very small segment of the market.

Cote D’Ivoire

Several global players dominate Ivory Coast’s insurance market, including: Allianz (France), AXA Insurance (Portugal) and the Sahaam Group (Partly owned by Sanlam in South Africa). The local players performing well include SUNU Insurance, La Loyale Group, competing with a regional company NSIA Insurance (established in Nigeria) which has entered the West African market. The country has fragmented insurance sector with approximately 30 companies, that have managed to establish a high level of competition amongst themselves (Macropolis, 2012). Penetration rates however do remain modestly low; between 1.0 – 1.3 % from 1995 to 2012 (Swiss Re, 2016). As at 2012, Sahaam (22.5%), NSIA (13.2%), ALLIANZ (10.18%), LMAI (8.33%) and AXA Insurance (6.65%) dominated 65% of the non-life insurance market (Chleuh, 2012, p. 5).

Gabon

After Côte d’Ivoire and Cameroon, Gabon is the third-largest insurance market among the Inter African Conference on Insurance Markets, however it is still massively underdeveloped with premiums accounting for less than 1% of GDP. The non-life market dominates the sector, and “is driven by a handful of insurance lines such as automotive and transport, which are mandatory and fire. In the 2014 figures from FEGASA⁷, Ogar remains the largest insurer by premiums, with a 32.6% market share followed by NSIA gained a foothold in the automotive segment, where it held the largest portion of premiums. Gabon remains one of the most dynamic insurance markets in the region, with growth in total premiums representing an opportunity for both domestic and foreign insurance providers” (Oxford Business Group, 2016). Regional players have entered the Gabonese market, with Moroccan Sahaam Group acquiring Colina in 2014 – which is now the third largest non-life business in the region.

⁷ FEGASA is the Federation Gabonese des Sociétés d’Assurances

Ghana

Currently, the ratio of insurance premiums to GDP is still below 1%. However, “average growth in Ghana’s insurance sector was an impressive 30% per annum during 2006 to 2009, with the life segment being responsible for most of this expansion. For now, insurance is dominated by businesses, but with a growing middle class, operators are expecting strong growth in the retail segment in the coming years. A study by FinMark Trust, commissioned by the National Insurance Commission (NIC), found that more than 23 million Ghanaians (out of a total population of 25.9 million) were living without any form of insurance in 2012. Strong levels of economic growth and the development of the oil & gas sector should provide the impetus for the expansion of the insurance industry” (KPMG, 2012, p. 13). Another market segment showing promise in the non-life sector is funeral cover.

Mali

There is little to no information on the insurance market in Mali. Eighty percent of the population is involved in agricultural activities and the remainder in mining. According to the Swiss Re data (2016) total premiums to GDP have not risen beyond 0.5% in the country since 1999, there is little room for domestic non-life insurance demand to develop.

Nigeria

Despite being the 3rd largest market by nominal insurance premium figures, market penetration is at a low 0.68%. There are many insurance companies in the market (16 life, 30 non-life, 11 composite companies and 2 re-insurers) however these companies are “too small to manage large risks, (therefore) oils companies tend to use foreign companies. Furthermore, preliminary data for Nigeria suggested that “premiums contracted by 1.8% from 2014 to 2015 due to the weak economic environment because of low oil prices and the uncertainty before the and after the presidential elections in 2015.” (Swiss Re, 2016, p. 34) Beyond companies being undercapitalized, domestic insurance companies lack the skills to manage specialized risks” (KPMG, 2012, p. 12).

Togo

“There were 14 insurance companies operating in the Togolese insurance industry at the end of 2011. Of these, seven were non-life insurers, five were life insurers and two were reinsurers” (ResearchMoz, 2014). The non-life segment accounted for the largest share of 45.2% of the total insurance written premium value in 2013. Despite an established group of players in the market, the market remains underdeveloped relative to other African markets with a penetration rate of 1,1% as at 2014 (Swiss Re, 2016).

Table 2.5 Characteristics of the Non-life insurance markets in West Africa (2013)

	<i>Penetration rate (2013)</i>	<i>Non-life penetration rate</i>	<i>Number of Non-Life Firms</i>	<i>Minimum Capital</i>	<i>Number of Business Lines</i>
<i>Benin</i>	0.7% (2012)	0.4%	6 domestic, 2 foreign	XDF 1 BN	Motor*, TPL*, Cargo import*
<i>Cameroon</i>	0.9%	0.6%	11 domestic, 5 foreign	XAF 1 BN	Motor*, TPL*, Construction*, Cargo import*
<i>Cape Verde</i>	1.2%	1.15%	2 composite	-	Motor*, Accident, Fire, Construction, Maritime, Transport, and Civil liability
<i>Cote D'Ivoire</i>	1.3% (2012)	0.7%	6 domestic, 5 foreign	XDF 1 BN	Motor*, TPL*, Cargo import*
<i>Gabon</i>	0.9% (2012)	0.7%	2 domestic, 3 foreign	XAF 1 BN	Motor, Fire
<i>Ghana</i>	1.0% (2011)	0.6%	-	GHC 15 MN – GHC 37,5 MN	Retail, Motor*, TPL*, Fire insurance for commercial buildings*, Funeral
<i>Mali</i>	0.5% (2012)	0.4%	4 domestic, 5 composite	XDF 1 BN	Motor*, TPL*, Cargo import*
<i>Nigeria</i>	0.6% (2011)	0.5%	30 domestic (with 11 composite)	N 20 BN – N 100 BN	Motor*, TPL*, Group Life&, Occupier liability*, Construction*
<i>Togo</i>	1.9%	1.1%	14	XDF 1 BN	Motor*, TPL*, Cargo import*

Source: African Insurance Regulation Directory (Schanz & Company, 2015), World Insurance in 2014: back to life (Swiss Re, 2015). Note: * denotes a compulsory product line by law

Senegal and Niger had little reliable information available for further review in this paper. Whilst Swiss Re provides penetration rate data for these markets, beyond this no research into these countries insurance sectors is publicly available.

Conclusions on Sub-Regional Analysis of Non-Life Insurance markets across Africa

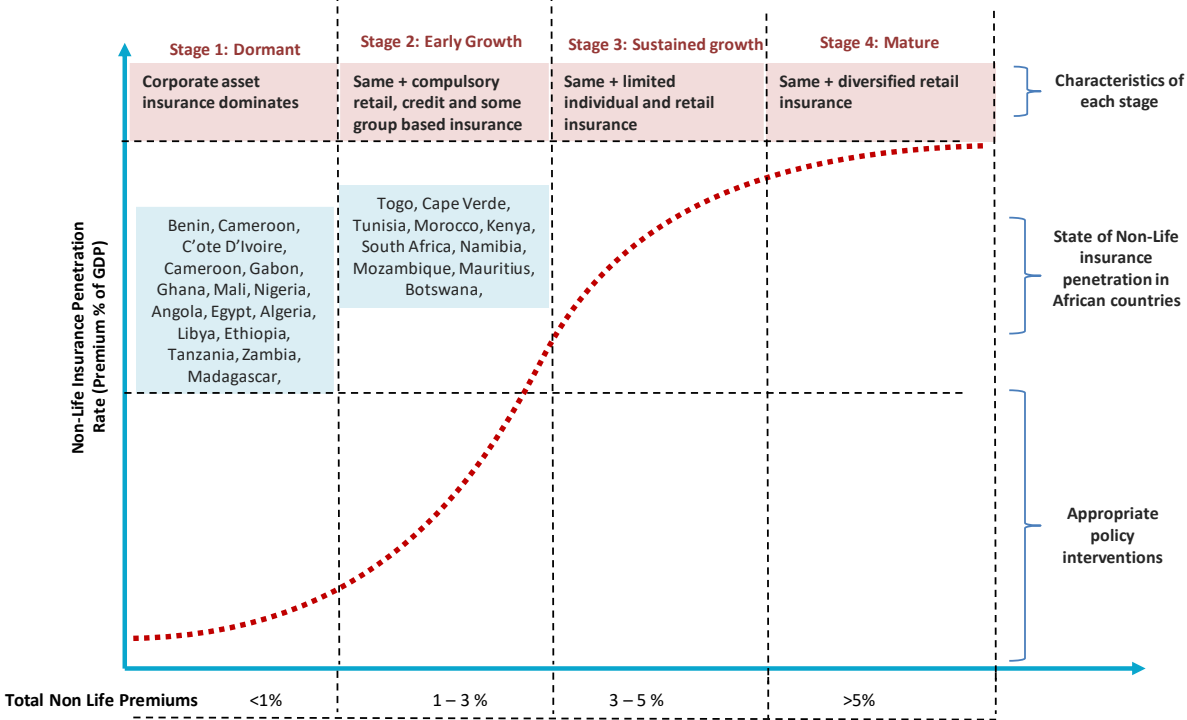
The Southern and East African markets represent the highest levels of insurance development on the continent, with Namibia, South Africa and Mauritius exhibiting above average insurance penetration relative to their GDP per capita figures. However, the disparity between developed and nascent markets within the regions is drastic, with markets like Sudan and Rwanda which trail behind, being amongst the worst across the continent in terms of premiums underwritten. Despite a lot of potential for high insurance demand in Central and West Africa growth led by oil exports has resulted in high inflation rates, placing pressure on the price of insurance, whilst restrictive legislative policies have left the sector underdeveloped. Both leading markets in the region (Nigeria & Ghana) are nominally amongst the largest contributors to total premiums in Africa, however relative to the level of economic growth, they lag what would be expected in a market booming because of this surge in economic performance due to the abundance of natural resources. “The insurance sector in West Africa is regulated and supervised by a regional body, the Inter-Professional Committee of the Insurance Market CIMA⁸, established on July 10, 1992 in Yaoundé⁹. The CIMA Treaty came into effect on February 15, 1995. Although the insurance sector is underdeveloped with premiums accounting for less than 1% of GDP, the number of insurance entities in the CEMAC countries has increased from 29 in 2002 to 36 in 2006, stimulated by low capital requirements” (Kouassi, Akpapuna, & Soededje, pp. 48-49). In North Africa, Morocco and Egypt are the two economies that exhibit above average insurance penetration rates relative to their GDP’s and are the leading economies that constitute the insurance market in North Africa. Despite high GDPs in this region, most countries trail substantially behind in relation to insurance development when looking at the penetration rates. It has been suggested that the reason for this could be cultural / religious reasons as the dominant Muslim community forbids conventional insurance products. However, since alternatives have been developed in Morocco (i.e. Takaful insurance), there may be other reasons beyond the cultural factors that are relevant to the state of the insurance market in the region.

Based on the key insights for the non-life sector highlighted in this chapter, the graph below organises depicts the characteristics of the sector at various stages of development:

⁸ CIMA is the Conférence Internationale des Marchés d’Assurances

⁹ It includes the following countries: Benin, Burkina, Cameroon, Central Africa, the Comoros, Ivory Coast, Gabon, Equatorial Guinea, Guinea Bissau, Mali, Niger, Senegal, Chad and Togo.

Figure 1: Stages of development of insurance markets in selected African countries.



Note: This framework for analysis was initially used to assess policy interventions in the life insurance sector and has been adapted for the purposes of this study to assess the non-life sector (Chamberlain, Camargo, & Coetze, 2017).

In the dormant phase, corporate product lines dominate the non-life sector to secure goods and services exchanged across countries. Countries typically have a non-life penetration rates, lower than 1 %. The early growth phase, is characterised by established corporate product lines in addition to various compulsory individual product lines, as well as credit insurance products offered through the bank and/or traditional insurance companies. Distribution channels, have typically advanced beyond broker networks, into bancassurance (and in the case of East Africa, mobile distribution channels) however there is limited understanding of the relevance of insurance products which stifles demand. There is also limited regulatory supervision, and limited product / company information. Countries typically have a non-life insurance penetration rates of between 1 – 3 %.

The sustained growth phase is characterised by compulsory product lines, and limited individual / retail insurance products. Whilst strictly speaking, none of the countries studied were in this phase of growth by penetration rate, by volumes South Africa possesses characteristics of this stage. Countries typically have a non-life insurance penetration rate of between 3 – 5%. The mature stage is characterised by a diversified non-life insurance companies offering compulsory and additional products across corporate and individual lines sub-regionally. The regulatory space is well synchronised, with clear cross border systems and

processes across regions, enabling businesses and individuals to access cover across the region through their choice provider. Countries typically have a non-life insurance penetration rate of more than 5%.

2.3 The impact of Macro–economic factors on Non-Life Insurance Demand

Macroeconomic factors have been the amongst the most tested in determining what drives non-life insurance demand across developed and developing markets. Because insurance companies make money by investing premium payments, the economy can greatly impact an insurance business. Insurance companies invest premiums in dividend-paying stocks, mortgage-backed securities, real estate and financial institutions, such as banks, all of which are vulnerable to economic shocks “When the economy is doing well, investment returns will increase and insurance companies may be more likely to accept a claim. When investment returns diminish in a down economy, insurance companies need to make the lost money back somehow, sometimes by taking out loans or by scrutinizing claims more closely and denying claims. When the economy is down, fewer small businesses have extra money to spend on insurance” (Dwilson, 2016). This means the demand for insurance is down and providers must compete more with one another. Research from 1988 to date has established a significant relationship of non-life insurance demand influencing economic growth (Esho, Kirievsky, Ward, & Zurbruegg, 2005). In both developed (Beenstock, Dickinson, & Khajuria, 1988) (Browne, Chung, & Frees, 2000) and developing (Garcia, 2012) (Stojic & Njegomir, 2012) (Akinlo & Apansile, 2014) countries, a positive relationship between economic growth and non-life insurance demand is evident. Studies of developed markets have used changes in GDP per Capita to consider the impact of economic growth on non-life insurance demand. From a demand-leading perspective, as the economy expands, through producing more goods and services, consumers have more disposable income which to purchase assets. As they purchase more valuable assets, they are likely to consider the risk of damage and/or loss to those assets, and therefore set aside more to secure their assets through insurance. In Africa, non-life insurance demand has typically risen the most within car and home insurance products. The supply-leading approach however, has however been given more attention. “A large body of literature has emphasized how [the growth] in financial systems influences long run growth rates through affecting savings and investment” decisions. By transforming savings into investments, through collecting premiums insurance providers play a maturity transformation role that catalyses higher production of goods and services in the economy, boosting economic

growth. This supply leading process, in addition to the various other benefits of increased financial services products, is seen more broadly as the basis for a positive relationship between insurance activity and economic growth. More recent research by Akinlo & Apansile (2014) has evaluated the influence of non-life insurance demand on economic growth in Sub-Saharan for 30 African countries, and found that “in the short run insurance premiums might not have a positive significant effect on economic growth, but in the long run insurance will have positive and significant relationship with economic growth” (Akinlo & Apansile, 2014, p. 125). The following section defines and assess the most prominent economic variables that have been utilised in previous studies for inclusion in this study to determines which factors affect non-life insurance demand.

2.3.4 Income levels

Whilst studies have assessed the impact of the growth of the insurance sector on economic growth (as noted above), less have paid attention to the impact of rising income levels on non-life insurance demand. Income may have a demand leading relationship with non-life penetration rates suggesting that there is a bi-directional relationship between the level of insurance development and the economic development and increased disposable income for individuals results in consumers demanding more financial services products such as insurance. If the negative relationship holds, the study can conclude that whilst improved levels of non-life insurance demand fuel economic growth, a higher standard of living does not necessarily lead to higher consumption of non-life insurance products in Africa. This paper will use GDP per capita levels as a proxy for the level of income and to test which relationship holds for the African region. The only study to assess this relationship considered at what level of economic growth, non-life insurance may have a more pronounced effect, finding that whilst “insurance penetration rises with GDP per capita, different levels of GDP are assumed to be accompanied by different growth rates of penetration... [and in fact] non-life insurance would have a bigger impact on economic growth at low and middle levels of economic development” (Arena, 2008)

2.3.5 Inflation Rates

Inflation “is the rate at which the general level of prices for goods and services is rising and, consequently, the purchasing power of currency is falling” (Investopedia, 2016) As purchasing

power falls, consumer's disposable income is prioritized more to necessity goods, and less on additional financial services products such as insurance. We would therefore expect a negative relationship between inflation rates and non-life insurance demand. Higher inflation rates, result in lower disposable income and reduced demand for financial services products to cover expected losses. "This inverse effect of inflation on life insurance, has been largely documented...[however] no such relation has been validated for property-liability (i.e. non-life) insurance" (Outreville F. J., 2013, p. 89). This paper will explore whether a significant relationship may exist between inflation rates and non-life insurance demand in Africa.

2.3.6 Interest Rates

Interest rates reflect the price of money for consumers; as it becomes more expensive to access debt capital (ie. Higher interest rates), individuals would be more willing to access insurance products to cover potential unexpected losses. Underwriting cycle theory further suggests that "when interest rates are high in the market place, insurance prices will be low due to a higher loss ratio¹⁰" suggesting that more consumers would be attracted to non-life insurance products as opposed to using debt to cover unexpected losses (Ma & Pope, 2003). Interest rates are therefore anticipated to have a positive effect on non-life insurance demand. Only one study has considered the impact of interest rates on non-life insurance demand in 1988; and found that indeed there was a positive effect on non-life (property liability) insurance demand (Beenstock, Dickinson, & Khajuria, 1988).

2.3.7 Unemployment Rates

Unemployment rates, represent the ability individuals to access wages/salaries to cover their expenses. It is likely that a negative relationship between non-life insurance demand and inflation rates holds, as less people would not afford to take up value added financial services products such as insurance. Evidence on the effect of unemployment on demand is limited and no prior research has tested the relationship of this variable on non-life insurance demand (Outreville F. J., 2013, p. 91).

2.3.8 Financial or Banking Sector Development

"Financial depth captures the size of the financial sector relative to the economy. It is the size of banks, non-banking financial institutions, and financial markets in a country, taken together

¹⁰ Loss ratio: this ratio is defined as "the total losses paid by an insurance company in the form of claims", calculated as total losses paid out in claims divided by total premiums paid (Bishop, 2009)

and compared to a measure of economic output” (World Bank, 2016). Early studies by Outreville, included this factor in the determinants for non-life insurance demand, supposing that the growth of the financial services sectors would be a catalyst for insurance demand. However, they found this variable was insignificant in their models. An explanation provided is that the endogenous nature, of the Broad Money to GDP (i.e. M2/GDP) variable utilized to test the impact of financial development on non-life insurance demand “would not allow the proxy for banking sector development to convey additional information” (Arena, 2008, p. 930). The data to calculate broad money (M2) likely includes contributions from the insurance sector, therefore it leads to statistically insignificant conclusions.

2.3.9 Foreign and Direct Investment (FDI)

“Foreign direct investment (FDI) is an investment made by a company or individual in one country in business interests in another country, in the form of either establishing business operations or acquiring business assets in the other country, such as ownership or controlling interest in a foreign company.” (Investopedia, 2016) Two studies on the developing and developed world have looked at the impact of foreign direct investment on non-life insurance demand, with “following important clients [being] cited as one of the major reasons for service firms to expand internationally.” (Skipper, 1998) Interestingly, in 2003 Ma & Pope considered this relationship on 9 OECD states and found that FDI was insignificant to the level of non-life insurance demand. Stojic, et. al. (2012) also looked at the attractiveness of the non-life insurance market in 15 developing Eastern Europe countries to foreign insurers, and found that FDI was not a significant determinant of whether foreign insurers would invest in Eastern European markets. “This suggests that whilst following major clients abroad has been cited as a major motivator in the establishment of operations abroad, pursuit of such clients does not necessarily suggest a significant international insurance presence in each market. (Ma & Pope, 2003, p. 244).

2.3.10 Market Structure

Within developed and developing markets, market concentration has been identified as a statistically significant determinant of non-life insurance demand in studies by Ma & Pope (2003), Treerattanapun (2011) and Stojic & Njengomir (2012). The measurement variable used to test market concentration is the Herfindhal Index, which sums the market shares of the ten largest non-life insurers in the market and multiplies the result by 10000. A monopolistic insurance market will have a score of 10000, whilst more competitive markets exhibit scores

below 1800. The verified relationship has been that a negative relationship exists between market concentration and insurance demand. The less competitive an insurance market is (i.e. higher Herfindhal Index Score), the less it attracts foreign insurers who can bring improves business processes and product innovation into the sector, therefore the less increase in non-life insurance demand we will experience. Conversely, the more competitive the sector is (i.e. lower Herfindhal Index Score), the more non-life insurance demand should increase. An alternate measurement approach utilized by Ma & Pope (2003) within developed markets was to consider the density ratio of foreign premiums as an indicator for market competitiveness. This would be an interesting variable to consider in future, when data become available for countries across Africa.

2.3.11 Trade Openness

Trade openness is a measured through “looking at the ratio of exports (and imports) to GDP” (Outreville F. J., 2013, p. 95). The expectation is that more openness (i.e. higher ratio) would positively impact non-life insurance demand, as increased trade would require more companies to protect their goods and/or services against potential future losses or damage, increasing the need for non-life insurance products. Prior studies by Arena (2008) and Akinlo & Apansile (2014) have considered the effect of the degree of openness on economic growth, within models to test the relationship between non-life insurance demand and economic growth. However, this relationship has not been tested in relation to the impact of trade openness on non-life insurance demand This study will utilise Merchandise trade statistics as a proxy for trade openness to test this further.

2.3.12 Price of Insurance

The effect of the price of insurance on non-life insurance demand has been evaluated in many studies, including in Outreville’s landmark study in 1990. It reflects the cost of providing insurance services or the service providers’ willingness to pay out for claims. As the costs of providing insurance services increases, insurer’s providers are paying out more claims, and this would drive up demand from customers. The price of insurance has typically been measured as the inverse of the loss ratio. The most recent study to include this variable was by Ma & Pope (2003), when assessing the role of legal factors in influencing non-life insurance. They looked at the role of the price of insurance in 44 developed countries, and found that it had a significant effect in decreasing non-life insurance demand. Another study considered foreign premiums’ market share, as a proxy for price of insurance. "This proxy [assumed] that the

market share of foreign insurers correlates with price" (Browne, Chung, & Frees, 2000, p. 77). The reasoning being that if foreign firms enter, then there will be a higher quality of goods in the market, which increases options in the market (variable goods) thus prices are lower. Due to lack of availability of claims information, or foreign premiums for non-life markets in African countries, this variable will not be tested further this study.

2.4 The impact of Social factors on Non-Life Insurance Demand

The insurance business is a complex and competitive industry that depends on many interconnected social factors. Even though insurance companies have financial responsibilities, such as addressing claims, issuing policies and performing underwriting tasks, the social side of the business is just as important. Insurance agents must possess strong social and interpersonal skills so they can effectively sell their products and services (Tucker, 2016). Impediments to this process, would stunt the commercial growth of insurance businesses, and therefore limit a rise in penetration rates. There is a need, therefore to understand social human behaviour in relation to eagerness to purchase products, and this section considers primary social factors that have been researched in previous literature in relation to non-life insurance demand.

2.4.4 Agricultural Status

One of the first social factors to be considered in terms of its effect on non-life insurance demand is the agricultural status of an economy - proxied in Outreville's study as the percentage of people in the agricultural workforce. "As the marketing of insurance among rural populations is difficult in most developing countries, an agricultural economy may lower demand for insurance" thus a negative relationship is anticipated between agricultural status and insurance demand (Outreville F. J., 1990). Outreville's study found that an insignificant relationship between agricultural status and non-life insurance demand existed, and consequently the variable has typically been discarded from future studies to date.

2.4.5 Human Capital Endowment

Human capital endowment has typically been understood in economics, as a contributor to an economy's ability to be more productive. A highly skilled labour force, is likely to improve an

economy's manufacturing capabilities, boosting gross domestic product and the level of income (in the long run). As the level of income rises, there is greater need for financial services products (including insurance) as individuals purchase more assets with their disposable income. A human capital augmented Solow-Growth model explained that output and the marginal product of capital are lower in poor countries because they have less human capital than rich countries (Mankiw, Romer, & Weil, 1992). This study hypothesises that there would be a positive relationship between human capital endowment and non-life insurance demand. Gross tertiary enrolment has been used as the proxy variable for measuring human capital endowment in previous studies with an anticipated positive relationship with non-life insurance demand. Whilst a positive correlation between human capital endowment and economic growth has been statistically significant (Arena, 2008) (Akinlo & Apansile, 2014), the same has not applied for human capital endowment and non-life insurance demand. Instead an insignificant relationship between non-life insurance demand and human capital endowment has been discovered in landmark studies by: (Outreville F. J., 1990), (Treerattanapun, 2011) and (Browne, Chung, & Frees, 2000). A 2012 study of determinants of non-life insurance demand in Portugal omitted the variable altogether based on previous results (Garcia, 2012). Furthermore, the applicability of this variables use for cross sectional analysis has been critiqued, since "the quality of education is hardly measurable and comparable across countries...[therefore] tertiary education may not be a good proxy of one's understanding of insurance products as the knowledge of these products may not be taught in schools [or tertiary institutions]" (Treerattanapun, 2011, p. 10).

2.4.6 Risk Aversion

Risk aversion is a measure of an individuals' unwillingness to purchase insurance products on the basis that they would likely not require protection against future damage, and would be able to cover their potential losses from savings in the event damage to their goods or property. From a commercial view, it is the likelihood that capital reserves would be able to cover damages (without incurring the additional cost of insurance) whilst for an individual it is the likelihood that one's personal savings would be able to cover damages if they occurred. The level of education (which is likely to be correlated to higher disposable income) of an individual has been used as the proxy for measuring risk aversion across personal lines, whilst a measure for risk aversion in commercial lines has not been tested. The proxy used for risk aversion has also been problematic, as it assumes that more highly educated individuals are more highly

paid, and furthermore does not consider the effect on commercial insurance products in aggregate non-life insurance data.

Initially it was anticipated that a positive relationship would exist between risk aversion and non-life insurance demand, since “the more risk averse an individual is, the higher the amount insured” based on prior studies of the impact of risk aversion on life insurance (Browne & Kim, 1993). Browne & Kim (1993) argued that in general a higher level of risk aversion leads to greater awareness of the necessity of insurance. Outreville & Spiro (Relative Risk Aversion and Human Resources Development: An Empirical Note) however “provided evidence that aversion toward risk is negatively correlated with higher education. They argued that higher education leads to lower risk aversion that in turn leads to more risk taking by skilled and well educated people” (Browne, Chung, & Frees, 2000, pp. 77-78). More educated (and by assumption more highly paid) individuals would be less willing to take up insurance products, as they could afford to replace assets in the event of damage, unless required by law to take up specific insurance products (e.g. housing and car insurance). Research into the effect of risk aversion on non-life insurance demand has been inconclusive with statistically insignificant results for motor vehicle insurance, and significant (negatively related) relationship in a general liability pooled cross sectional analysis (Browne, Chung, & Frees, 2000). Due to the bias within the proxy for risk aversion and poor predictability of the relationship at an aggregate level being identified for risk aversion, this variable will not be tested for in this paper.

2.4.7 *Wealth*

The demand for insurance is postulated to “increase with wealth when individuals are characterized by increasing relative risk aversion” (Saatio, 1971). In contrast Mossin (1968) argues that insurance coverage decreases with wealth, along the lines of Outreville & Szpiro’s argument for how risk aversion and insurance demand would be negatively related. Since this relationship lies in the ambiguity of the risk aversion-insurance demand relationship, we will not explore this variable in greater detail.

2.4.8 *Probability of loss*

The probability of loss, is assumed to be positively related to non-life insurance demand, since an expectation of future losses would encourage one to protect themselves from incurring the costs of this event. Research into probability of loss, has found that “the maximum premium and individual is willing to pay for a full property insurance coverage increases with the

probability of loss” in developed markets (Mossin, 1968). This loss probability has typically been proxied by urbanisation rates, since “prior studies have suggested that the frequency of losses is greater in areas with higher rates of urbanisation as a higher rate of interaction exists among individuals” (Browne, Chung, & Frees, 2000). Another variable utilized to test probability of loss is the crime rate in a country. Esho, et. al (2005, p. 271) notes that, “a country where crime is reported will more likely reflect an insurance industry with higher claims rates and more consumers willing to purchase insurance.” The anticipated relationship therefore was that higher crime rates, resulted in higher demand for non-life insurance products; this was proved to be statistically significant in developed markets (Esho, Kirievsky, Ward, & Zurbruegg, 2005). Research into the impact of loss probability on non-life insurance demand (using urbanisation rates) has found this variable to be insignificant, except in general liability lines where minor statistical significance was detected in a pooled cross sectional model of all OECD markets between 1987 – 1993 (Browne, Chung, & Frees, 2000). This would suggest that in general liability insurance consumption, lower urbanisation rates may in fact boost consumption unlike in other product lines (e.g. motor vehicle). The result however was still treated with caution since it did not also apply in the fixed effects model (over time and individual countries), therefore probability of loss is still considered insignificant in most cases.

Whilst research has been done to consider the effect of social factors on non-life insurance demand, little evidence of these factors being significant to non-life insurance demand has been found. Based on a review of the literature on social factors above this study will only consider the effect of the probability of loss on non-life insurance demand in this study.

2.5 The impact of Cultural factors on Non-Life Insurance Demand

Culture, is defined as the “shared patterns of behaviours and interactions, cognitive constructs and understanding that are learned by socialisation... [it is] the characteristics and knowledge of a particular group of people defined by everything from language, religion, cuisine, social habits, music and arts” (Zimmermann, 2015). The impact of culture on financial systems is a relatively new area of study with the rationale for testing these variables on financial systems or products only recently being considered. Often, where it has been studied in the context of the insurance sector, it has largely been to consider the impact of organisational culture on effectiveness, as opposed to national culture on insurance demand. “Although some recent papers have focused on [the impact of] Hofstede cultural variables in the life insurance sector

it is surprising that this subject remained unexplored for a long time” more so for non-life insurance research. In Lemaire, et. al. (2011) it was found that “culture impacts non-life insurance more in affluent countries...with an adjusted R square coefficient increasing by 20%”. Whilst Treerattanapun (2011) notes that despite covering a larger and more selective representation of developed and developing countries “the sample tends to be biased towards developed European countries, thus including countries from Africa and Central Asia may give more solid results.”

The metric utilised for defining and identifying cultural factors has been Hofstede’s study, which identified four dimensions of national culture, for 64 countries across 116 000 participants in 1983. The dimensions included: Power Distance, Individualism, Masculinity and Uncertainty Avoidance. These four dimensions collectively explained 49% of the variability in cultural factors across these countries, whilst other organisational culture measures explained the rest.

2.5.4 Uncertainty Avoidance

Uncertainty Avoidance, is a measure expressing “the degree to which the members of a society feel uncomfortable with uncertainty and ambiguity” (Itim International, 2016). It is anticipated that a high level of uncertainty avoidance would correspond with increased insurance demand, as people feel less out of control, with potential unexpected losses. A statistically significant positive relationship between uncertainty avoidance and non-life insurance demand has been identified in the two studies to date (Lemaire & Park, 2011) (Treerattanapun, 2011). Nations with a high degree of uncertainty avoidance tend to have a high level of non-life insurance consumption. However, the “eclectic” way in which Hofstede measures uncertainty avoidance (and power distance) based on theoretical reasoning rather than factor analysis draws caution to the reliability of the results (Karolyi, 2016, p. 614).

2.5.5 Power Distance

The Power Distance Index measures “the degree to which the less powerful members of society accept and expect that power is distributed unequally. The fundamental issue here is how society handles inequality among people” (Itim International, 2016). Chui & Kwok (2008) suggest that “the population of a high-power distance country, expects their country to take sufficient actions to reduce risk” and compensate for it, such as developing a road accident fund for motor vehicle users, which would lower the requirement to protect themselves against

potential losses in future. Whilst the example noted considers the effect of high power distance in non-life insurance context, it is important to clarify that their paper focused on the effect on high power distance on life insurance demand. Extrapolating this to our desired segment, nations with a low level of power distance to have a high level of non-life insurance consumption as they do not expect government to step in and take the necessary steps to reduce risks. It was found that this negative relationship between non-life insurance demand and power distance, held in both developing and developed countries (Lemaire & Park, 2011) (Treerattanapun, 2011).

2.5.6 Individualism versus Collectivism

Individualism considers whether “individuals are expected to take care only of themselves and their immediate families”; whereas collectivism considers the individual’s reciprocal role in society where they take care of certain needs and “expect their relatives or members of a particular group to look after them in exchange” (Itim International, 2016). A statistically significant positive relationship between individualism and non-life insurance demand has been proven (Treerattanapun, 2011) (Lemaire & Park, 2011). In the context of insurance, we expect more individualistic people to purchase higher levels of insurance products in comparison to more collective-driven societies. Insurance demand would therefore be positively related to individualism and negatively related to collectivism.

2.5.7 Masculinity versus Femininity

Masculinity “evaluates whether biological differences impact roles in society” (Treerattanapun, 2011, p. 6). Whilst Chui& Kwok (2008) found that feminine societies purchased more [life] insurance products, as [they] are very sensitive to the needs of their family and want to protect them” an alternate argument for masculine societies being dominant has been advanced to be more in control of the future. The effect of masculinity on non-life insurance may therefore be ambiguous in non-life insurance consumption. When tested recently, this variable was insignificant, and therefore further conclusions on its impact have remained ambiguous (Lemaire & Park, 2011) (Treerattanapun, 2011).

2.5.8 Religion (Christian, Buddhist, Islam)

“An individual’s religion can provide insight into the individual’s behaviour; understanding religion is an important component of understanding a nation’s unique culture” (Outreville F. J., 2013). Research into the effect of different religions on non-life insurance demand has suggested that, only Islam has a significantly affected demand negatively (Browne & Kim, 1993). Buddhist and Christian beliefs have had no statistically significant effect on non-life insurance demand (Lemaire & Park, 2011) (Treerattanapun, 2011).

The lack of availability of data on Hofstede’s cultural factors for developing economies has stunted further research. Due to lack of availability of data (Hofstede’s variables, only have statistics for select Eastern and North Western African countries) and no clear method for assigning cultural values to countries without figures, we are unable to make empirical conclusions on the relevance of cultural factors on non-life insurance demand for African countries alone as desired in this paper.

2.6 The impact of Institutional factors on Non-Life Insurance Demand

Beyond the macroeconomic, social and cultural factors that affect insurance, there are several political and regulatory factors that impact the institutional framework within which insurance providers can operate. Whilst less attention is paid to these factors within this paper, several papers have considered their role in non-life insurance consumption; and for the purposes of a complete literature review they have been included in this chapter.

2.6.4 Legal System (Common, Civil or Islamic law)

The legal environment is critical to financial services products, as it governs the conditions under which they can be provided, distributed and purchased by consumers. "The importance of the legal to the insurance industry [also] stems from the positive probability of insurance company insolvency...systems that protect creditors rights and therefore promote external debt markets should similarly facilitate insurance demand” (Esho, Kirievsky, Ward, & Zurbruegg, 2005, p. 268). Several papers have considered which legal systems provide a positive environment for insurance products to thrive and have found that apart from Islamic law, most legal systems are appropriate for insurance products (Lemaire & Park, 2011). The basis for Islamic law’s disapproval is that “insurance is the sale of uncertainty - which is the strongest reason for its prohibition, since insurance is effectively the sale of a commodity that Islamic

Law does not recognize as saleable” (IslamToday, 2016). Furthermore, the way in which insurance companies generate profits through investing returns, and gaining interest is another point of contention with the religion. It is therefore appropriate that on this basis, countries in Africa governed by Islamic Law, or with a large Muslim population experience lower penetration rates (Egypt at 0.7% & Nigeria at 0.3%) than other faith countries. Research into other legal systems also reveals that “common law countries provide the greatest protection of shareholder and creditor rights, while French civil law countries provide the least protection” (Esho, Kirievsky, Ward, & Zurbruegg, 2005, p. 268) Results in empirical studies are positive and significant when considering a dummy variable to account for the common law system in property liability insurance (Browne, Chung, & Frees, 2000) (Lemaire & Park, 2011) (Treerattanapun, 2011). This variable however, has been understudied due to the lack of good indicators for the type of legal system being available.

2.6.5 Regulatory Enforcement

Regulatory enforcement also has a significant effect on insurance consumption, as it determines the ability of the regulatory environment to be upheld. Esho, et. al (2005) found that a positive and significant relationship between Property Rights and non-life insurance demand existed in his study of the role of legal factors in influencing non-life insurance. The proxy variable utilized was Knack & Keefer’s (1995) Fifty Point Property Rights Index which considers: corruption of government, rule of law, expropriation risk, repudiation of contracts by government & the quality of bureaucracy. He found that, “property rights provide individuals and firms with the rights to own and sell assets...in terms of insurance, the enforcement of property rights creates an economic incentive to acquire and insure property, since government and legal enforcement of property rights help to protect individuals from loss or damage to the asset” (Esho, Kirievsky, Ward, & Zurbruegg, 2005, p. 268). This variable has had little attention in previous studies, with only this study by Esho, et. al. exploring regulatory enforcement’s effect on non-life insurance demand.

2.6.6 Political Risk & Governance

“There has been a surge of interest in the consequences of governance for development and how a country risk could have an impact on global investment strategies by transnational corporations” (Outreville F. J., 2013) . This country risk rating includes several factors such as political risk, access to finance, sovereign risk and credit ratings, which affect the ability of financial services providers to manipulate the financial structures to generate profits. Two

studies have considered the impact of country risk on non-life insurance demand and found that a negative and empirically significant relationship exists; where “a higher level of insurance consumption is observed in a region that has low political and investment risk” (Treerattanapun, 2011, p. 10) (Lemaire & Park, 2011). No consensus on the proxy variable to be used for measuring country risk has been established as there are many databases measuring country risk but with little public access to their results available.

2.6.7 Barriers to Entry

Only one study by Stojic & Njengomir (2012) has considered the impact of barriers to entry on non-life insurance demand. The proxy variable used is the Index of Economic Freedom Data collected by The Heritage Foundation, which looks at property rights, freedom from corruption, fiscal freedom, government spending, business freedom, labour freedom, monetary freedom, trade freedom, investment freedom and financial freedom. They found that a statistically significant positive relationship exists between this variable and insurance consumption. No further research into this variable has been conducted.

2.7 Empirical Literature Review

The study as mentioned, will focus on determinants of non-life insurance demand because limited research has been done on these products - more so for the African continent. In a survey that identified 85 empirical papers on the insurance growth nexus in 2013, “only 22 papers are investigating property liability (i.e., non-life insurance). Among these studies 15 are looking at the causality links between insurance and economic growth [even less at determinants of insurance demand]” (Outreville F. J., 2013, p. 73). Currently the number stands at 9 peer reviewed, published papers on non-life insurance demand, without a single one focused on the African market exclusively. The landmark empirical studies assessing the determinants of non-life insurance demand have summarised below to provide an overview of the current body of work, which was utilised as a basis for this literature review.

Table 2.6 Summary of landmark empirical studies on non-life insurance demand

Authors	Objective of Study	Methodology	Countries	Results
(Beenstock, Dickinson, & Khajuria, 1988)	To assess which economic variables significantly affect non-life insurance demand	Data: 1981 Cross sectional Data OLS Regression Analysis Output: ANOVA (F test), T test & R ² Validity: t-test	12 countries (developed), 45 countries (developed and developing)	Dependent variable: property liability insurance penetration rate Significant variables: income (+), interest rates Insignificant variables: economic growth, unemployment
(Outreville F. J., 1990)	Testing the relationship between insurance development and financial development	Data: 1981 Cross Sectional Data OLS Regression Analysis Output: ANOVA (F test), T test & R ² Validity: t-test	33 developing countries (21 African) in Latin America, Asia and Africa	Dependent variable: Property Liability insurance penetration rate Significant variables: economic growth (+), financial development (+) Insignificant variables: price of insurance, agricultural status, human capital endowment, monopolistic insurance market
(Browne, Chung, & Frees, 2000)	This paper reviews the determinants of 2 different non-life insurance products in OECD markets.	Data: 1987 – 1993; panel data disaggregated across varying non-life product lines (can test country specific factors) Fixed effects Panel Data Model Pooled Cross Sectional Model Reliability: Durbin Watson test (autocorrelation), Scatter plot (Heteroskedasticity) Validity: Haussmann test	25 OECD states	Dependent variable: motor vehicle & general liability insurance penetration rates Significant variables: income (+), price of insurance (-), wealth (+) Insignificant variables: risk aversion, legal system (common/statutory)
(Ma & Pope, 2003)	Looks at the globalization of non-life insurance demand - what determinants affect foreign insurers expansion into other markets?	Data: 1995 – 1998 Panel Data Fixed Effects Regression Analysis	Developed (9 OECD)	Dependent variable: foreign premiums Significant variables: market structure (Herfindhal Index, 5% sig level [-]), insurance demand (GDP per capita, 5% sig level [+]), price of insurance (interest rates, 1% sig level [+]) (1/loss ratio, 1% sig level [-]) Insignificant variables: trade barriers, FDI

(Esho, Kirievsky, Ward, & Zurbruegg, 2005)	This paper considers "the role of law in explaining the depth and growth of the insurance industry across countries" (Esho, Kirievsky, Ward, & Zurbruegg, 2005, p. 266)	Data: 1984 – 1998 Panel Data OLS, Fixed Effects & GMM Models	Developed (44 countries, 12 EU)	Dependent variable: Property-Causality Insurance Consumption Significant variables: economic development (+), property rights (+), price of insurance (1/loss ration [+] in GMM), risk aversion, 5% sig level [+] in FE, loss probability (urban rates [+], crime rate [+])
(Lemaire & Park, 2011)	Looks at whether consumers may respond to insurance solicitations according to their cultural beliefs, not only economic rationality	Data: 10-year period (dates unclear) Blocking Regression Models Bootstrapping Regression Models Output: ANOVA (F test), t-test & R ²	Developed & Developing (82 countries)	Dependent variable: non-life insurance consumption Significant variables: market concentration (-), common law (+), Islamic law (-), political risk (+), Islamic beliefs (-), power distance (-), individualism (+), uncertainty avoidance (+), Insignificant variables: GDP per Capita, Urbanisation rates, Education, Buddhist beliefs, Christian beliefs, masculinity
(Treerattanapun, 2011)	Looks at whether consumers may respond to insurance solicitations according to their cultural beliefs, not only economic rationality	Data: 1999 - 2008 Blocking Regression Models Bootstrapping Regression Models Output: ANOVA (F test), t-test & R ²	Developed & Developing (82 countries)	Dependent variable: non-life insurance consumption Significant variables: market concentration (-), common law (+), Islamic law (-), political risk (+), Islamic beliefs (-), power distance (-), individualism (+), uncertainty avoidance (+), Insignificant variables: GDP per Capita, Urbanisation rates, Education, Buddhist beliefs, Christian beliefs, masculinity
(Garcia, 2012)	The paper considers the relevance of property liability insurance premiums on economic & financial development. As well as looking at the determinants of non-life insurance in the country.	Data: 1962 – 2003 (time series) Linear OLS Regressions Analysis Output: ANOVA (F test), T test & R ² Reliability: Augmented Dickey-Fuller test (Stationarity), White test & Breusch-Pagan test (Heteroskedasticity), Engel-Granger test (integration)	Country Case Study (Portugal)	Dependent variables: property liability insurance development Significant variables: economic growth (+) Insignificant variables: financial development (M1/M2), financial development (M2/GDP)

(Eastern Europe) (Stojic & Njegomir, 2012)	This paper looks at the attractiveness of the non-life insurance market in Eastern Europe to foreign insurers.	Data: 2004 – 2009, panel data. Fixed Effects Panel Data Model Output: ANOVA (F test), t-test & R ² Validity: Haussmann test	15 Eastern (developing) European countries	Dependent variable: foreign company premiums Significant variables: market concentration, 1% sig level (-), barriers to entry, 5% sig level (+), insurance demand (+), return on investment, 10% (+), economic growth (+) Insignificant variables: human capital investment, market profitability (
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This literature reviewed the current state of non-life insurance demand across 28 African markets (understudy) and the empirical research to date that has explored the determinants of non-life insurance demand. In this chapter, we find that the sector is still largely focused on reviewing the determinant of life insurance demand, with little attention paid to the non-life sector. Additionally, only economic factors have been extensively studied with only 2 studies exploring the effects of cultural dynamics, and another considering legal/regulatory factors in the current body of work. Several socio-economic variables, have been deemed relevant to pursue empirically in greater detail and the following chapter will describe how these variables will be empirically reviewed for significant impact on non-life insurance demand in Africa.

CHAPTER THREE RESEARCH METHODOLOGY

3.1 Research Approach and Strategy

This chapter explains the methodological basis of our research design, and provides further input into the: research design, procedures for data collection, population samples, definitions of variables used, and the method of analysis of results

3.2 Research Design

To examine the effects of these factors across multiple countries, over an extensive period (1990 – 2013), the study employs a regression analysis technique that considers the multi-dimensional nature of the data collected in this study. Panel-data observations have two dimensions: x_{it} , where i runs from 1 to N and denotes the cross-sectional unit (e.g. i = country 1, country 2, and country 3) and t runs from 1 to T (*i.e.* $t= 1, 2, \dots T$) and denotes the time of the observation (e.g. 1991, 1992, 1993, etc.) as below:

$$y_{i,t1} = \mu_{i,t1} + \beta_{t1}x'_{i,t1}$$

$$y_{i,t2} = \mu_{i,t2} + \beta_{t2}x'_{i,t2}$$

....

$$y_{i,T} = \mu_{i,T} + \beta_T x'_{i,T}$$

We can express this concisely using \mathbf{Y}_i to represent the vector of individual outcomes for person i across all time periods:

$$\mathbf{Y}_i = \beta X_i + u_i$$

$$\text{Where } y'_i = y_{i,t1}, y_{i,t2}, \dots, y_{iT}$$

Adapted from: Linear Panel Data Regression Model (*McManus, 2011, p. 10*)

There are two kinds of panel data that we can consider. *Balanced panels* have every observation from 1 to N observable units in every period 1 to T ; whereas *Unbalanced Panels* have missing data observations for some variables across time or cross-sectional units. Another distinction that can be made in panel data is whether the panel is a *Long panel* or a *Short panel*. A short panel is one in which there are few periods and many individual units; whereas a long panel one with many time periods and few individual units.

Panel data recently gained prominence in the 21st century because of “increased availability [and] greater capacity of statistical software for modelling” the complex of phenomenon beyond a single cross-section or time-series (Hsiao, 2007, p. 2). By blending the inter-individual differences and intra-individual dynamics, panel data has several advantages over cross-sectional or time-series data. It provides a more adequate inference of model parameters due to higher degrees of freedom in the models, in comparison to cross sectional or time series analysis. Panel data also allows for greater capacity to capture complex human behaviour, as “it is possible to obtain a more accurate description of an individual’s behaviour by supplementing observations of the individual in question with data on other individuals” allowing us to uncover dynamic relationships across populations (Hsiao, 2007, p. 3). Finally, panel data allows us to control for omitted variables. “It is frequently argued that the real reason one finds (or does not find) certain effects is due to ignoring the effects of certain variables in one’s model specification which are correlated with the included explanatory variables. Panel data contains information on both the inter-temporal dynamics and the individuality of the entities allowing one to control the effects of missing or unobserved variables” (Hsiao, 2007, p. 5). Whilst panel data has become extremely relevant in exploring change within, between and across cross sectional units over time, it is not without its disadvantages.

The challenges presented by panel data, are primarily the availability of such data, particularly for developing countries. In the case of this study, we must design our own set of panel data for the population (i.e. Africa). This process involved collecting data and converting it into a software readable format, for further analysis – a process which is both time consuming and laborious. Beyond the length of time of the process, there are few platforms for these data sets defined by researchers to then be made publicly available. Another constraint has been that whilst conclusions on panel data models, are generalized to the continent (i.e. the population sample), there may be variations observed between values calculated based on the sample data, that may skew our results (as is relevant to the true population) due to random sampling error. These chance fluctuations resulting from the idiosyncratic composition of a specific sample, require a word of caution; our results may be significant however they are not necessarily conclusive. Finally, “the power of panel data to isolate the effects of specific actions, treatments or more general policies depends critically on the compatibility of the assumptions of statistical tools with the data generating process” (Hsiao, 2007, pp. 25, 26).

3.3 Estimation of Panel Data Regression Models

The type of models which can accommodate differences in country characteristics (cross-sectional) over time (periodical) are called panel data regression models; they have been utilised in previous studies. There are three main panel data regression models we will consider in our study. These include the Pooled OLS, the Fixed Effects and the Random Effects regression model. This section, will define and outline the nature of each of these models, and provide insight into how they could help us in understanding what determines non-life insurance demand.

OLS Pooled Regression Model

The Ordinary Least Squares Pooled model is the simplest form of regression model; it is a multiple regression model applied to panel data. The model is expressed as follows:

$$Y_{it} = \beta_0 + \beta_1 X_1 + \dots + \beta_2 X_2 + \mu_{it}$$

Where:

Y_{it} is the dependent variable (DV) where i = entity and t = time

X_k represents independent variables (IV)

β_k is the coefficient for the IVs

μ_{it} is the overall error term

k is variable 1, 2 ... n

The benefit of a pooled OLS Regression estimator is that it approximates the sample population more accurately, in comparison to the other two models which are prone to omitted variable bias.¹¹ However, its primary disadvantage is that it disregards the individual and time dimensions of panel data and assumes that the relationship must hold for all observations for that variable across time. Pooled OLS regression models, therefore may be described as models that are consistent (as they closely approximate the population) but not efficient.

Fixed Effects Panel Data Model

¹¹ Omitted variable bias: the bias that appears in the estimates of parameters in a regression analysis, when the assumed specification is incorrect in that it omits an independent variable that is correlated with both the dependent variable and one or more included independent variables.

This is a model used when you are only interested in analysing the impact of variables that vary over time. Fixed effects models remove the effect of those time-invariant characteristics so we can assess the net effect of the predictors on the outcome variable. It “includes dummy variables for each period in a one way or two-way specification with fixed-effects for time” (McManus, 2011, pp. 2, 6). The model is expressed as follows:

$$Y_{it} = \beta_0 + \beta_{k1}X_{1,it} + \dots + \beta_k X_{k,it} + Y_2E_2 + \dots + Y_nE_n + \mu_{it} \text{ [eq. 2]}$$

Where:

Y_{it} is the dependent variable (DV) where i = entity and t = time

X_{k,it} represents independent variables (IV)

β_k is the coefficient for the IVs

μ_{it} is the error term

E_n is the entity n. Since they are binary (dummies) you have n – 1 entities included in the model

Y₂ is the coefficient for the binary repressors (entities)

You could add time effects (two-way specification) to the entity model to have a time and entity fixed effects regression model:

$$Y_{it} = \beta_0 + \beta_{k1}X_{1,it} + \dots + \beta_k X_{k,it} + Y_2E_2 + \dots + Y_nE_n + \delta_2T_2 \dots + \delta_tT_t + \mu_{it}$$

Where:

Y_{it} is the dependent variable (DV) where i = entity and t = time

X_{k,it} represents independent variables (IV)

β_k is the coefficient for the IVs

μ_{it} is the error term

E_n is the entity n. Since they are binary (dummies) you have n – 1 entities included in the model

Y₂ is the coefficient for the binary repressors (entities)

T_{t2} is time as a binary variable (dummy), so we have t – 1 time periods

δ_t is the coefficient for the binary time regressors

The disadvantage of a fixed effects model is that it cannot be used to measure time invariant causes of the independent variables, and therefore we would only be able to utilise it to test the macroeconomic and social time variant factors.

Random Effects Panel Data Model

Random effects assume that the entity's error term is not correlated with the predictors which allows for time-invariant variables to play a role as explanatory variables. The model is expressed as follows:

$$Y_{it} = \beta_0 + \beta_1 x_1 + \beta_2 X_2 + x_k \beta_k + c + \mu$$

Where:

Y_{it} is the dependent variable (DV) where *i* = entity and *t* = time

X_{k,it} represents independent variables (IV)

β_k is the coefficient for the IVs

μ_{it} is the error term

c is the heterogeneity component

Since μ is uncorrelated with all the explanatory variables, we can write this model as follows, where the error term has both an idiosyncratic, μ and an unobserved heterogeneity component, c :

$$Y_{it} = \beta_0 + \beta_1 x_1 + \beta_2 X_2 + x_k \beta_k + v$$
$$v = c + u$$

It would be ideal to utilise the random effects model, since differences across countries may affect insurance demand. For comparisons across regions this model would be appropriate, however you need to specify those individual characteristics that may or may not influence the predictor variables. The problem with this is that some variables may not be available therefore leading to omitted variable bias in the model.

3.4 Empirical Model and Research Design

Based on the review of the literature, this study adopts a similar empirical regression model to Ma and Pope (2003) and tests the following variables for significant impact on non-life insurance demand across Africa:

$$\begin{aligned} \log nlpn_{i,t} = & \beta_0 + \beta_1 \log income_{i,t} + \beta_2 \log inflation_{i,t} + \beta_3 \log interest_{i,t} + \beta_4 \log unemployment_{i,t} \\ & + \beta_5 \log trade_{i,t} + \beta_6 \log domestic\ credit_{i,t} + \beta_7 \log urbanrate_{i,t} + \varepsilon_{i,t} \end{aligned}$$

where $\log nlpn_{i,t}$ is the ratio of non-life premiums to GDP for country *i* in year *t*. The definition of the independent variables is presented in Table 3.1 on the next page.

Table 3.1 Hypothesised relationships for all variables tested in the study¹²

Name of Variable	Measurable instrument	Expected effect on Insurance Demand
Income	GDP per Capita	Positive
Inflation	Log inflation rates	Positive
Unemployment	Log Unemployment rates	Negative
Domestic Credit to private sector	Ratio of Domestic Credit to Private Sector / GDP	Positive
Trade openness	Merchandise Trade Ratios	Positive
Probability of Loss	Urbanisation Rates	Positive

Procedure for Data Collection

As previously mentioned, this study will only make use of secondary data (i.e. previously collected data) in its analysis of the determinants of non-life insurance demand. The World Bank Databank was the primary portal for data collection. Whilst we have accessed all the data from the World Bank Databank, it is important to note that this is a source base which uses secondary data from multiple platforms, including: UNESCO, International Labour Organisation, International Monetary Fund, International Financial statistics. All the variables which will be included in the study, their definitions and the sources of such data have been outlined in [Appendix B](#). The data collected will be constructed into a panel data set for the purposes of this study.

It is important to note that in designing the panel data logarithms will be used to smooth the variables for cross country comparisons and avoid heteroscedasticity in our analysis. “An interesting property of the logarithm is that errors in predicting the logged series can be interpreted as approximate percentage errors in predicting the original series. Thus, when using least-squares estimation to fit a linear forecasting model to *logged* data, this implicitly minimises mean squared *percentage* error, rather than mean squared error in the original units, which is good thing if the log transformation is appropriate” (Duke University, 2016).

The Research Instrument

The research instrument that will be used to generate regression results for this study will be the R integrated suite of software for data manipulation, calculation and graphical display. R is

¹² Definitions for all the independent variables mentioned in Table 3.1 have been included in [Appendix B. Sources of Data \(Definitions & Sources\)](#)

a language and environment that “provides a wide variety of statistical (linear and nonlinear modelling, classical statistical tests, time-series analysis, classification, clustering, ...) and graphical techniques” (The R Foundation, 2016). It includes: “an effective data handling and storage facility, a suite of operators for calculations on arrays, in particular matrices, a large, coherent, integrated collection of intermediate tools for data analysis (including a panel data analysis package) and graphical facilities for data analysis and display either on-screen or on hardcopy (The R Foundation, 2016).

3.3 Population and Sample

The population for this study is defined as the 28 countries on the African continent (over the period 1990 – 2013) which possess measurable non-life insurance markets. This population has been established, based on reputable data from the Swiss Re Institute, which identifies countries with substantial non-life premiums to GDP data (i.e. penetration rate) data available over the period of the study. These countries have formed the basis of our sample to analyse the effect of macroeconomic and social factors on non-life insurance demand in Africa; hence they were extensively reviewed in our literature review. [Appendix A](#) summarises the countries included in the study. A sample will be drawn out of this population, based on the data the regression models require to draw conclusions on the relationships between the independent and independent variables considering missing variables. In addition, while the review of the literature identified several factors that affect the consumption of non-life insurance demand, the choice of variables employed in the regression model is mainly influenced by data availability.

3.4 Data Analysis and Interpretation

In developing the regression models for our findings, a process which utilises *Backward Elimination* is used to develop the best fit model which explains the determinants of non-life insurance demand in Africa. In this process, “all the independent variables are entered and then each one is deleted one at a time if they do not contribute to the regression equation” (Statistics Solutions, 2016). Considerations for whether a variable sufficiently contributes to determining non-life insurance demand will include the statistical significance of the variable in the model (significance level), whether the variable improves the overall predictability of non-life insurance demand (R-squared) as well as the statistical accuracy of the estimate (low standard error). The best fit models will be reported in the results, and interpreted to consider their overall

impact on non-life insurance demand. A common mistake many scholars make in interpreting regression results, is to “imply that changes in the independent variable *cause* changes in the dependent variable. It must be emphasised that we cannot infer a causal relationship from statistics alone. Any inference about the cause of the changes in the dependent variable must be justified by a reasonable theoretical relationship” (Keller , 2012, p. 613).

3.5 Research Reliability and Validity

3.9.1 *Internal Validity*

To test the internal validity of our regression, model the following is assessed from the three model outputs.

Validity of Independent Variables

Our first consideration in testing the validity of the regression models, will be the null hypothesis that none of the independent variables ($x_1, x_2 \dots x_n$) is linearly related to y . That is:

$$H_0: \beta_1 = \beta_2 = \beta_3 = \dots \beta_n = 0$$

$$H_1: \text{at least one } \beta_i \text{ is not equal to } 0$$

“If the null hypothesis is true we have an invalid model; however, if we can reject the null hypothesis then and at least one β_i is not equal to zero then the model has some validity” (Keller , 2012, p. 665). This test however is a very weak test to establish validity on, as it does not consider the strength of the model to explain/predict the dependent variable.

Coefficient of determination

Another method of testing the validity of the regression model will be to consider how much variation is explained by the explanatory variables, relative to the error term in the model. Here I utilise the coefficient of determination (R^2) to ascertain whether the model explains a substantial portion of the total variation of the dependent variable.

$$R^2 = 1 - \frac{SSE}{\Sigma(y_i - \bar{y})}$$

If the SSE (unexplained variation) is large, then most of the model presents a poor fit and has little validity. When SEE is large, the overall R squared value would be small (or closer to zero). If SSE is small however, then the explained variation (SSR) measured by the model is higher and R squared to be closer to 1, signifying a good model.

F-Test

The final test for validity will be the value of the F-Test statistic generated by the model results. “A large value of F indicates that most of the variation in the dependent variable (y) is explained by the regression equation and that the model is valid” (Keller , 2012, p. 666). For this test, the rejection region (usually at the 5% significance level, $\alpha=0,05$) is where:

$$F > F_{\alpha,k,n-k-1}$$

If the F statistic is lower than that defined in the F tables, the conclusion is the model is valid, at the 5% significance level. If, however the F statistic is higher than that defined in the F tables then would consider the model to be a poor fit, at the 5% significance level.

3.9.2 External Validity

When considering the external validity on which model would provide the most accurate results for our study, several tests have been designed to help us select the model appropriate model results for further analysis.

Lagrange multiplier (plm test)

The Lagrange Multiplier test helps you decide between a random effects regression and a simple OLS regression. The null hypothesis in the LM test is that variances across entities are zero, i.e. there is no significant difference across units (i.e. no panel effect). If the LM test’s p-value is very small, and there are significant effects and the Random Effects Model is a better estimator than the OLS Pooled Regression model.

F Test (pFtest)

The F-Test for individual effects helps you decide between a fixed effects regression and a simple OLS regression. If the F-test’s p-value is very small, and there are significant effects and the Fixed Effects Model is a better estimator than the OLS Pooled Regression model.

Hausman Test (phtest)

The Hausman test helps us to decide between whether to opt for a Random Effects (RE) or a Fixed Effect (FE) Panel Data Regression Model. The common decision rule is that you use random-effects unless the Hausmann test rejects it. The principle of the test is that it tests for the exogeneity of the Unobserved Error Component. If the unobserved effects are exogenous,

the FE and RE are asymptotically equivalent; thus, random effects are preferred because it is a more efficient estimator. The Hausman test is rejected if the estimates are sufficiently different, and the fixed-effects estimators are sufficiently precise. When the results, return “one model as inconsistent” with a small p value the conclusion is that the Fixed Effects model is a better predictor than the Random Effects model. Two forms of the Hausman test will be applied to these models.

3.9.3 Reliability

Cross-sectional dependence is a problem in macro panels with long time series (over 20-30 years). Serial correlation may apply to macro panels with long time series (over 20-30 years). Serial correlation causes the standard errors of the coefficients to be smaller than they should be, resulting in higher R-squared being reported. The following tests are originally meant to use the residuals of separate estimations of one time-series regression for each cross-sectional unit to check for cross-sectional dependence. This paper utilises a correlation matrix to consider multi-collinearity in our study.

3.6 Assumptions and Limitations of the Study

A key assumption made in this paper, is that the secondary data collected is deemed reputable and accurate. I also assume that systems of collecting data remain unchanged over time, for the variables considered, and where drastic changes have been made, they have been recorded in the data sets and considered relative to prior output. I assume that the period over which the data has been collected, reflects the timescales I intend to consider for this paper; that is data used is collected annually in the same way across all data sets. Finally, I assume the databases used maintain up to date data sets and there are no concerns regarding the reliability of the secondary on the account of this. Another limitation of this study, closely tied to availability of data, is the inability to consider determinants for non-life insurance demand as per product lines (e.g. property, car insurance, housing, liability cover, etc.). As more data becomes available, it would be great to follow up with further research on determinants in different product lines as well as the cultural and/or institutional factors that impact non-life insurance demand in Africa. Finally, it would have been interesting to consider the validity of these factors across different markets on continent (that is: Central, East, Southern, North and West Africa) to develop relevant sub-regional policy interventions to stimulate non-life insurance demand. This however is beyond the scope of this study. The following chapter, will explore

in detail the nature of the empirical analysis conducted, the research design and how the validity of the results will be tested.

CHAPTER FOUR

RESEARCH FINDINGS

4.1 Introduction

This chapter presents the results of the hypotheses put forward in this paper (as outlined in Chapter 1 Section 1.4). It proceeds with the discussion of the descriptive statistics of the variables used in the regression model, followed by a discussion of the regression output. The chapter ends with a discussion on the validity of the estimated regression models.

4.2 Descriptive Statistics and Correlation Matrix

The summary of descriptive statistics, outlined in Table 4.1 drawn from the population panel data built over the 23-year period. Overall the population panel data was unbalanced with a potential 672 observations per variable except for the non-life penetration variable, been possible over the period (1990 – 2013). This section will highlight some initial insights into the nature of the variables included in the regression model. Based on the sample data, macroeconomic variables typically had more than 75% of the observations per variable in the period under study, whilst the Social variables had between 50% to 95% of the observations per variable.

Table 4.1: Summary of Descriptive Statistics

Name of Variable	Observations	Mean	Median	Minimum	Maximum	Std.dev
Non-Life Penetration	580	1.004	0.750	0.019	14.862	1.023
Income	672	1883.358	873.930	111.530	14231.600	2277.234
Inflation	655	26.329	6.360	-11.690	4145.110	204.148
Trade	672	55.072	51.375	4.910	134.340	20.402
Domestic Credit	660	25.777	15.815	2.010	160.120	26.422
Unemployment	560	11.004	9.000	0.700	37.600	6.820
Urban Rate	672	41.226	40.290	11.560	86.660	17.110
Population	672	67.340	43.930	1.720	620.030	106.964

Source: Results from research data

Our sample mean non-life insurance penetration rate of 1 % is lower than the regional average reported in 2015 of 2.8%. Whilst the observed mean may be low, it likely smooths the effect of the top 7 non-life insurance markets (whose averages are higher than the 2.8% regional average) and provides a clearer representation of where the market really is. As noted earlier on in our

literature review, many African markets remain nascent, and this supports the need to stimulate growth of the sector. Relative to global GDP per Capita (US\$ 12780,64 as at 2015), the sample’s average of US\$ 1883,4 is substantially below global levels. Merchandise trade is substantially high for African markets, contributing to 55.1% of GDP on average in our sample data. Also, domestic credit to the private sector (as a percentage of GDP) contributes to approximately 25.8% of GDP on average in our sample data set. Since these variables dominate the macroeconomic landscape, they are likely to influence non-life insurance demand. The urbanisation rate (used as proxy for probability of loss) is moderate with an average of 41.26% however the range is significantly large (minimum = 11.56%, maximum = 86.6%) suggesting an unexpected outcome for this variable may be possible. The growing population rate at 67% the region presents a burgeoning market for insurance demand.

4.3 Correlation Matrix

The correlation matrix in Table 4.2 presents the correlation coefficients which examines the strength of the dependence among the independence variables and the potential problem. From the Table, it can be observed that the estimated correlation coefficients for the independent variables are below the threshold level of 0.70 (Kennedy , 2008) which will result in multicollinearity when collectively included in a regression model.

Table 4.2: Correlation Matrix

	1	2	3	4	5	6	7	8
1 Penetration	1							
2 Income	0.1019** (0.0141)	1						
3 Inflation	0.5565*** (0.000)	-0.0599 (0.1254)	1					
4 Trade	0.2281*** (0.000)	0.4115*** (0.000)	0.1276*** (0.0011)	1				
5 Domestic Credit	0.2987*** (0.000)	0.4016 (0.000)	-0.0645 (0.102)	0.072* (0.0646)	1			
6 Unemployment	0.1245*** (0.006)	0.5048*** (0.000)	-0.0462 (0.28)	0.2379*** (0.000)	0.3326*** (0.000)	1		
7 Urban rate	0.0325 (0.4348)	0.6281*** (0.000)	-0.0736 (0.0599)	0.3392*** (0.000)	0.3137*** (0.000)	0.4851*** (0.000)	1	
8 Population	0.1042** (0.012)	0.1447*** (0.0002)	-0.0458 (0.242)	0.1977*** (0.000)	0.2959*** (0.000)	0.2233*** (0.000)	-0.0591 (0.1262)	1

Note: Values in parentheses is the p-values; ***, ** and * denotes significance at 1%, 5% and 10% respectively
 Source: Results from research data

4.3 Regression Results

In predicting the variability of non-life insurance demand, the external validity tests find that the Fixed Effects regression model is the best predictor of the relationship of the independent

macro-economic variables to non-life insurance penetration rates and the results are externally valid. The Breusch and Pagan Lagrange Multiplier Test finds that, there is a panel effect, and therefore the OLS regression analysis alone cannot sufficiently explain the variation in non-life insurance demand. Whilst the Hausman Test and Robust Hausman Test find the Fixed Effects regression model, to be the most efficient estimator over the Random Effects Model. The Fixed Effects model is therefore externally valid. The results of the external validity tests are summarised in table 4.3.

We find that at least one of the independent variables is linearly related to non-life insurance demand, and the coefficient of determination is explaining at least 11% of the variability in non-life insurance penetration rates across Africa, therefore the model is internally valid. Finally, in considering the F test for this model, the F stat (7, 422) of 7.51 is significantly less than 5% therefore the model is internally valid.

Table 4.3: Summary of Internal and External Validity Results

Name of Test	Hypotheses	Results	Conclusion
Breusch and Pagan Lagrange Multiplier Test	H ₀ : No panel effect (OLS) H ₁ : There is a panel effect (RE)	$\chi^2 = 690.4$; Prob > $\chi^2 = 0.000$	Reject H ₀ ; There is panel effect (RE)
Hausman Test	H ₀ : Difference in coefficients not systematic (RE) H ₁ : Difference in coefficients systematic (FE)	Hausman $\chi^2 = 78.79$ Prob > $\chi^2 = 0.000$	Reject H ₀ ; FE is the most efficient estimator
Robust Hausman (Wooldridge, 2002)	H ₀ : Difference in coefficients not systematic (RE) H ₁ : Difference in coefficients systematic (FE)	Sargan-Hansen $\chi^2 = 29.093$ Prob > $\chi^2 = 0.0001$	Reject H ₀ ; FE is the most efficient estimator

Table 4.3 presents the results of the first hypothesis on whether macro-economic variables have a significant impact on non-life insurance demand. Based on the Fixed Effects model output above, the study finds that socio-economic factors do have a significant impact in explaining some variation in non-life insurance demand over the period studied, however the variables tested only explained 11.1% of the variation in non-life insurance penetration rates at best. This points to the relevance of cultural and regulatory dynamics in defining the trajectory of the sector’s growth. Almost 90% of the variability in penetration rates is not explained by the factors tested, suggesting that there are other factors (cultural, social or regulatory) that motivate consumers to purchase non-life insurance across the region.

Table 4.4: RE and FE Model Results

Dependent Variable: Non-Life Insurance Penetration						
	Fixed Effects			Random Effects		
	Coef.	t	P>t	Coef.	z	P>z
Constant	1.427 (1.054)	1.35	0.177	-1.137 (0.596)	-1.91	0.056*
Income	-0.949 (0.167)	-5.7	0.000***	-0.414 (0.120)	-3.44	0.001***
Inflation	0.093 (0.045)	2.06	0.040**	0.099 (0.045)	2.2	0.027**
Trade	-0.066 (0.089)	-0.74	0.458	0.156 (0.074)	2.11	0.035**
Domestic Credit	0.153 (0.053)	2.87	0.004***	0.205 (0.051)	4.05	0.000***
Unemployment	-0.554 (0.223)	-2.49	0.013**	0.158 (0.170)	0.93	0.354
Urban	-0.631 (0.427)	-1.48	0.140	0.198 (0.201)	0.98	0.325
Population	1.049 (0.291)	3.61	0.000***	0.004 (0.059)	0.07	0.944
F (7,422)/Wald χ^2	7.51			34.89		
Prob > F/ χ^2	0.000			0.000		
R-squared	0.1108			0.1475		
Countries	28			28		
Observations	457			457		

Note: All variables are transformed into the natural logarithm for the estimation; ***, ** and * denotes significance at 1%, 5% and 10% respectively. Source: Authors estimate from research data

From Table 4.4, a negative and significant coefficient is observed for the income variable. At 1% significance level, it indicates that decreasing income levels promotes increased demand for non-life insurance products. This suggests that non-life insurance products may be undervalued by the African consumer, who still prefers using their disposable income or leveraging their wages to settle expenses, including those that can be covered by insurance products. Concurrently when there is higher risk of unemployment, individuals are more likely to consider purchasing an insurance product, with 95% certainty. This implies that the African market, may not understand the need for insurance until they are in a position where it is required, and consumer education of the benefits of these products is required so that individuals are persuaded to access cover. Two other variables that were anticipated to have a negative impact – ie. urbanisation rates and merchandise trade have been found in this study to have an insignificant (at the 1%, 5% and 10%) effect on non-life insurance demand. This finding is consistent with evidence from the life in insurance market in Africa by Alhassan and Biekpe (2016).

Higher inflation rates have been deemed to have a positive impact on non-life insurance demand as observed from the estimated coefficient of 0,093 (at the 5% significance level), contradicting our initial hypothesis that higher inflation rates result in lower disposable income and reduced demand for financial services products to cover expected losses. Instead when there is pressure on disposable incomes, African consumers are less confident in their ability for their income to cover potential losses, and are more likely to consider taking out insurance to manage their expenses. This finding is inconsistent with evidence from previous findings by Outreville (2013) who had not established a significant relationship between inflation and property liability insurance demand.

The proportion of domestic credit to the private sector relative to total GDP also stimulates the need for non-life insurance products in the region. Government entities and/or parastatals may rely heavily on local treasury departments to cover their risks, and mostly private sector players recognise the immediate need to purchase non-life products. By stimulating debt capital to the private sector, lenders could impose insurance conditions creating the need to consider insurance when taking out debt capital. This could be partly explained by the increasing trend of credit insurance¹³ in the banking and retail sector on the continent. As noted in the literature review, this is the first study to verify a statistically significant relationship between increased private sector domestic credit and non-life insurance demand.

Finally, the growth in Africa's population stimulates higher demand for non-life insurance, largely due to a broader youth customer base to target in the years to come. This suggests that new products that cater to the needs of this growing population may need to be developed, as the population is ready to invest in non-life insurance products. Financial Sector Development's report suggests that, "it also means the risk pool will be larger, which reduces risk for insurers and allows them to offer cheaper products" (Chamberlain, Camargo, & Coetze, 2017). Proactive steps to address the unique dynamics of the market need to be considered for consumption to increase.

¹³ Credit insurance is the latest trend in the banking and retail sector. In South Africa the retail industry has picked up on the insurance opportunities which accompany a credit transaction...[-] this is a new area of development for the industry" (South African Insurance Association , 2010).

4.4 Summary

The results find that income levels contrast our anticipated effect in the literature review and instead have 99% certainty of negatively affecting non-life insurance demand whilst inflation rates have a 95% certainty of positively affect non-life insurance demand. As expected higher unemployment rates, do have a negative relationship with non-life insurance demand. In addition, financial resources provided to the private sector and boost non-life insurance demand in Africa. A new finding is the countries with sharp inclines in population growth, are likely to present new customer bases for non-life companies, however further research into what products new clients will demand is required to cater to this segment. The research findings above suggest that only 11.1% of the variables affecting non-life insurance consumption are understood – the industry requires further research on the cultural and regulatory nuances that may drive growth. The inability to measure the effect of these dynamics is profound since these factors could explain up to 90% of the tendencies in non-life insurance demand. The following chapter is dedicated to contextualising the results and providing recommendations for the sector’s development based on these results.

CHAPTER FIVE

CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the conclusion on the study in the form of: an analysis of the findings of for the determinants of non-life insurance demand in Africa, the policy recommendations that would encourage higher demand for non-life insurance products and suggestions for further research identified throughout the research process. The study has responded to a crucial gap in the body of knowledge on the dynamics of the non-life insurance market across Africa. Despite, premiums having doubled in the past decade (1995 – 2015) and African countries projected to grow at an average of 4.5% of GDP from 2015, the financial instruments to support riskier investments with high return on the continent remain under developed. Insurance companies which: boost commercial growth through risk transfer, encourage job creation as a key sub-sector in financial services, and drive economic growth as institutional investors are underperforming relative to the continents growing need for their products. At best, the non-life insurance penetration rate, currently sits at 1,0% on average for 28 select countries included in this study, despite the top 7 insurance markets having at least 65% of their portfolios consisting of these products. Without this being addressed, the demand leading connection of financial development supporting economic development through increased provision of financial services products is hampered and the region may fall short of attracting the level of sustainable long-term investments required to support economic growth. In short, non-life insurance products need to be stimulated to achieve the required level of economic growth that would support the continent's vibrant youth population's need for jobs and access to other financial products (eg. housing and car loans) for an improved standard of living. With the case for increased insurance penetration apparent, the study aimed to understand the nature of the sector across 28 countries, and how to create appropriate macro-economic and social conditions to bolster non-life insurance provision.

5.2 Summary of the findings

5.2.1 State of non-life insurance markets in Africa and policy recommendations

By evaluating key trends and determinants of the sector in select countries on the continent, the paper sought to understand which macro-economic and/or social characteristics impact non-

life insurance. The overall objective was to provide policy guidelines for regulators, governments and insurers affected by the current dynamic. In responding to the first research question, the literature review initially provided an in-depth assessment of select markets' insurance dynamics across Africa to contextualise the empirical findings and build rationale for divergent observations from other emerging and/or developed markets.

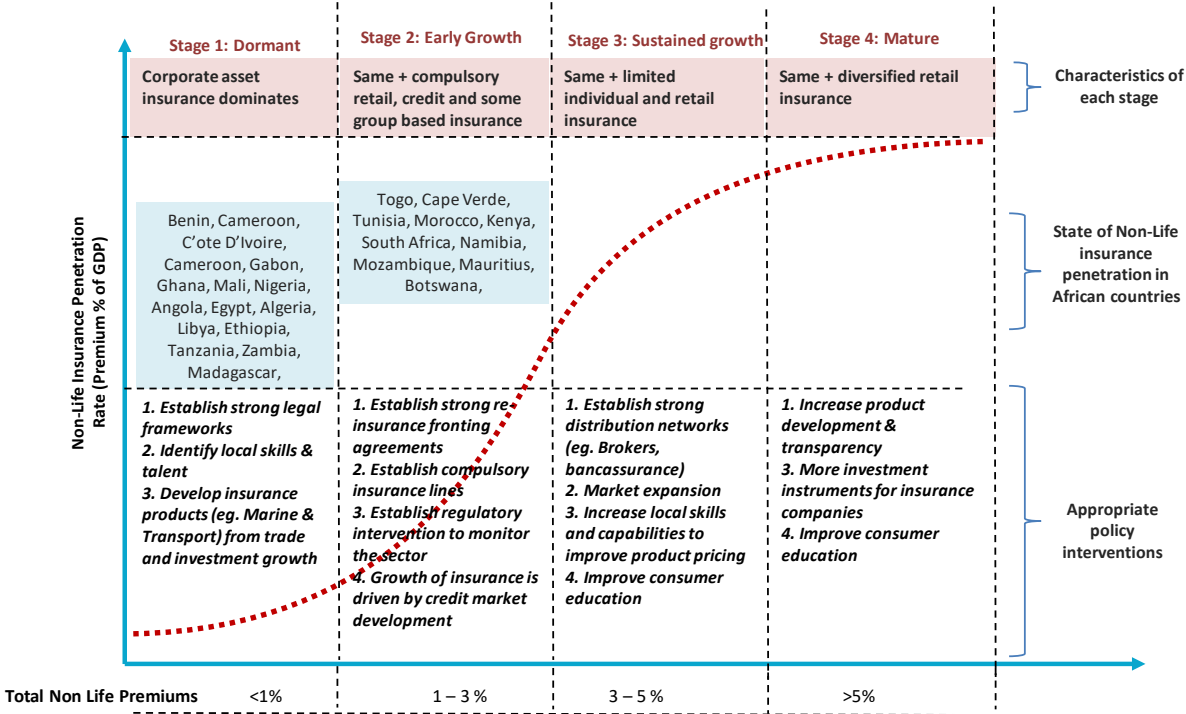
In Southern Africa, the disparity between established and underdeveloped insurance markets is drastic. South Africa, Namibia Botswana and Mauritius presented with an insurance penetration rate above 3% and had life insurance markets almost double the size of non-life, whilst Mozambique, Madagascar and Zambia (nascent insurance markets with less than 3% penetration rate) had non-life insurance as their primary product form. In the developing markets, basic insurance products such as fire, aviation and motor vehicle insurance dominated the product offering. Interestingly in Zambia when GDP per capita almost tripled the non-life insurance penetration rate declined by 50% in 2014; a similar phenomenon for South Africa was observed when non-life premiums rose as economic growth declined in 2014. This suggests that the level of income may lead to a negative perception for the need for non-life insurance products, with consumers opting to divert funds to other products when their disposable income increases. More may need to be done, to convey the importance of insurance to customers in these target markets, to prevent loss of clients, when the economy appears stable.

East Africa presented higher penetration rates, with mature life and non-life markets in Kenya and Tanzania, however socio-cultural barriers related to mistrust of insurance providers and a high Muslim population hamper the growth of the sector. In Ethiopia, a closed market prevents international players to improve insurance penetration rates - 17 state owned companies operating in the country resulting in the government having to assume the underwriting risk for the entire portfolio and stunting growth. Central Africa has experienced sporadic economic booms due to oil production from 2014, and with high inflation rates when oil prices have fallen which have put pressure on the pricing structure of insurance products in the sub region - due to the uncertainty associated with its economic growth trajectory. This in addition to tight regulatory controls, have led to an under developed insurance sector, of less than 3% penetration rate in Angola.

For North Africa, the barriers to insurance growth appear to be social with a clear majority of the population being Islam which rejects the structure of most insurance products, however even in markets where alternate products are offered penetration rates are less than 3%, suggesting that other factors (cultural or economic) may also play a role in non-life insurance demand. Egypt, Algeria, Libya and Tunisia all exhibit low penetration rates, dominated by non-life markets. Morocco, is the only market with a strong Takaful insurance market averaging 3% however the non-life market still has low product variability (47% is only car insurance). West Africa also remains under developed with all the markets (Nigeria, Benin, Cameroon, Cape Verde, C’ote D’Ivoire, Gabon, Ghana, Mali and Togo) having near 1% (and less than 3%) insurance penetration rates. In all markets, non-life dominated the sector, with rudimentary products such as motor vehicle (50% of total premiums in Cameroon and Cabo Verde) anchoring the market.

Based, on the current state of the non-life sector, several recommendations that can be put forward to encourage the sector’s development. Recommendations applicable at various stages of non-life insurance development are summarised as follows:

Figure 2: Understanding policy interventions in the non-life insurance sector across Africa



Note: This framework for analysis was initially used to assess policy interventions in the life insurance sector and has been adapted for the purposes of this study to assess the non-life sector (Chamberlain, Camargo, & Coetze, 2017).

As noted in the literature review, most governments of countries in the Dormant Phase have limited legal frameworks to regulate the sector, and in some cases governments have not established an independent regulator to grant licenses for insurance companies to operate. This restricts competition in the sector (and promotes monopoly insurance markets often dominated by parastatal insurance companies) and limits product diversification or market penetration. The primary interventions at this stage include: establishing strong legal frameworks for new players to enter the market and standardise requirements across the sector (especially for claims processes, and pricing of insurance products); and expanding the available products (beyond marine & transport insurance which typically dominate the sector in this phase) into personal products that can benefit individuals. To achieve this, there is a need for these countries to invest in building specialised skills in product pricing, brokering, and re-investment of premiums to insure there is a supply-driven push to advance the sector. The bulk of the countries in the study are still in this phase, with some having taken strides to initiate these activities; as noted in the literature review the West African region has set up the Inter-Professional Community of Insurance Market to regulate insurance protocols across the region. However, intra-country interventions on insurance monitoring and product diversification is limited, and attitudes towards encouraging foreign players into the market are hostile with only a few countries (Benin, Cameroon, C’ote D’Ivoire & Mali) allowing foreign players into their market. This results in limited opportunities for skills transfer and sustains oligopoly insurance markets in the region. A positive signal of African countries in this stage of growth has been that most of them have been able to establish compulsory product lines, which is typically a sign of development into the next phase; strategies to scales up access to these products are required for penetration rates to increase beyond the 1% mark.

In the Early Growth stage, there is a need to emphasise consumer education (done by companies and regulators) on the benefits of insurance products, in tandem with cementing compulsory product lines. Whilst economic growth may improve the conditions under which people would be willing to access products, without consumer education individuals defer to savings as a form of security for potential future losses as opposed to non-life products. Increased population growth, and demand for credit necessitate that insurance companies diversify their products into the micro-insurance and agricultural insurance space to attract a broader customer base. Finally, insurance regulators need to accommodate and have provisions for companies to offer bundled insurance products to increase penetration beyond compulsory product lines to additional cover that would be beneficial for customers.

In the Sustained Growth Phase, policy interventions required include: diversified multi-channel distribution networks, market expansion beyond the national level (as achieved by companies like Sanlam Emerging Markets, Old Mutual & Hollard International) as well as increased consumer education in sub-regional markets. There is a need for national regulators to cooperate at a regional level, for the advancement of companies operating at this stage, in standardising systems (eg. capital reserves requirements, licensing processes, national re-investment of premiums, bancassurance regulations, etc.) and building monitoring capabilities across regions.

Finally, in the Mature Growth phase, focus will be placed on product development and availability (eg. Takaful insurance across all countries), and opportunities to enable premiums re-invested to benefit the regions' economic growth. For this stage to be achieved, African countries, require stable economies (characterised by growing populations, and employment rates) saturated with consumer education of non-life insurance products. There is also a need for a strong re-insurance sector as well to allow for fronting agreements so that non-life companies to pass on risk to reinsurers, as well as risk based capital requirements to prevent liquidation of firms operating across multiple jurisdictions.

5.2.2 Determinants of non-life insurance demand in Africa and policy recommendations

The study has examined the explanatory factors of non-life insurance demand in Africa, using annual data on 28 countries from 1990 to 2013 in the econometric analysis. The study employs a Fixed effects panel data regression models to identify key determinants of non-life insurance demand in Africa. In this study, several macroeconomic factors explained the variation in non-life insurance demand across Africa countries well.

For income levels, a negative relationship between GDP per capita and non-life insurance demand existed in the Fixed Effects panel data model. This suggests that a higher standard of living does not necessarily lead to higher consumption of non-life insurance products across Africa. When individuals are uncertain about their ability to cover potential losses or damages they are more likely to consider purchasing an insurance product; however, with higher levels of disposable income, comes greater assurance to cover unexpected losses. How consumers are covering uninsured losses is unclear, but in higher income markets access to credit markets

is greater – there is high risk that these customers may be taking out loans to cover losses which may be costlier than contributing to a non-life product. From a supply-side, the pricing of insurance products may be too high and/or misunderstood by customers for them to consider it worthwhile for them to invest into. For companies anticipating higher economic growth, they may opt to underinsure and invest their capital reserves in other financial instruments to cover for potential damages or losses should they occur. Additionally, if claims processes are inefficient, companies may be opting to maintain reserves to cover damages or losses if event occur frequently as opposed to waiting for insurance companies to pay out. This suggests that mostly global firms with massive capital reserves and less need for creative insurance products that would be required by local companies still dominate the commercial sector in Africa, as they can offset expenses for damages in one market with profits from another region if necessary. This could also explain why product lines remain narrow in most African markets, as suggested in the literature review. To broaden the scope of products available, and increase insurance companies' gross premiums, these companies need to tailor their products to the unique needs of local companies and consumers in the market. Whilst the need to cover risks is clear, the desire to do so needs to be stimulated by new products and services from insurance companies operating in the region whilst educating customers on the benefits of these products. As a final option, enforcing mandatory product lines, where adverse selection is likely may be the only option for insurance regulators to consider when looking to stimulate uptake of certain product lines (as was the case with car insurance in most markets studied).

For inflation rates, this study found that there is a significant, positive relationship with non-life insurance demand, supporting the finding that changes in disposable income do result in increased uptake of financial services products in Africa. When customers do not see the benefit of these products in the medium to long run, relative to saving to cover for potential future losses, they will likely choose not to take up more insurance. However, when disposable income and savings are unable to cover potential losses, individuals and corporates are more likely to take up an insurance product.

This study was the first to test the impact of unemployment rates on non-life insurance demand, finding that a highly significant negative relationship exists between the two variables. As hypothesised, higher unemployment rates result in less people affording value added financial services products such as insurance. This barrier to affordability, may be the real reason why despite higher incomes individuals may opt out of certain products or deem non-life products

undesirable. Furthermore, because the primary mandatory products are typically offered together with a loan for an asset (eg. car or house) which requires full time employment, temporary employees are limited from accessing these products.

Another new variable tested was the effect of population growth rates in the region on non-life insurance demand; it was found that higher growth rates are likely to provide a unique customer base that will be open to insurance products, especially in markets such as Tanzania where 50% of the population is under 25 years old. Insurance companies should start thinking about how best to appeal to this market segment and consider innovative ways to appeal to them and design products tailored to their challenges and risk profiles, noting that most will not have a stable income in the challenging global economic landscape. There is a need to reimaging which product lines, could be tailored to their needs, and what forms of cover may need to be adapted for their context.

Another variable that the study tested for the first time was the ratio of domestic credit to the private sector as a percentage of GDP, which was found to have a highly significant positive influence on non-life insurance demand. This variable suggests that stimulating local companies to grow through providing debt financing will be the next channel for boosting growth in non-life insurance demand across the continent. Global companies which require insurance are already accessing the benefits of these products. Financial institutions operating on the continent therefore need to supporting local businesses, resulting in a higher likelihood of them requiring non-life insurance products. Governments and financial institutions may need to consider developing initiatives that encourage bundled commercial products (loan plus additional insurance cover as required) through bancassurance channels.

5.5 Recommendations for further research

Whilst the previous section has highlighted several opportunities for insurance regulators and companies to intervene for a supply driven approach to increasing demand, there are various areas where further research is required to understand what these actors are influenced by in the regulatory environment. The regulatory environment under which insurance companies operate in, as well as the ability for individual to access property rights creates an incentive for customers to own assets which require insurance and for insurance companies to provide these freely. In conjunction, the political risks and governance structures of African countries can

impact the need for insurance and ways in which companies can provide products affordably. Furthermore, consumer education needs to be sensitised to the cultural norms and differences across Africa that shape perceptions of non-life insurance products. As identified in the literature review, two other dimensions may significantly yield new determinants of non-life insurance demand across African markets. Three papers have been identified which look the impact of culture on non-life insurance demand. The first noted that including cultural factors “increased the predictive ability of regression models on life insurance consumption by 13%, [and yet] there are only a few studies which explore the area of [non-life] insurance” (Chui & Kwok, 2008). Only two other papers have considered the impact of culture on demand (Lemaire & Park, 2011) (Treerattanapun, 2011). Esho, et. al (2005) found that the demand for property-liability insurance is not significantly affected by cultural factors, whilst more recent papers examine these variables and find significant relationships by looking at panel data for a larger set of countries (Chui & Kwok, 2008) (Lemaire & Park, 2011) (Treerattanapun, 2011). These papers however do not exclusively look at the impact in developing markets - let alone African markets. To better understand the barriers to access to non-life insurance, further study into these dynamics needs to be explored. These dynamics also need to be empirically assessed in greater detail to further advise governments and regulators on the necessary interventions required for the sector to thrive.

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APPENDICES

Appendix A. List of 28 African Countries selected for the study

Countries	
Algeria	Madagascar
Benin	Mali
Botswana	Mauritius
Cameroon	Mozambique
Angola	Namibia
Cape Verde	Nigeria
Cote D'Ivoire	Morocco
Egypt	Niger
Ethiopia	Senegal
Gabon	South Africa
Ghana	Tanzania
Kenya	Togo
Libya	Tunisia
Malawi	Zambia

Appendix B. Sources of Data (Definitions & Sources)

Name of Variable	Measurement Variable	Definition	Data Source	Source Code
<i>Dependent Variable</i>				
Penetration	Non-life insurance premium volume to GDP (%)	Premium data is taken from various issues of Sigma reports (Swiss Re). Data on GDP in US dollars is from the electronic version of the World Development Indicators (Swiss Re , 2015).	Sigma Reports, Swiss Re	GFDD.DI.10
<i>Macroeconomic Variables</i>				
Income	GDP per capita (current US\$)	GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in current U.S. dollars (World Bank, 2015).	World Bank national accounts data, and OECD National Accounts data files	NY.GDP.PCAP.CD
Inflation	Inflation, consumer prices (annual %)	Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. The Laspeyres formula is generally used (World Bank, 2016).	International Monetary Fund, International Financial Statistics and data files.	FP.CPI.TO.TL.ZG

Interest	Real interest rate (%)	Real interest rate is the lending interest rate adjusted for inflation as measured by the GDP deflator. The terms and conditions attached to lending rates differ by country, however, limiting their comparability (World Bank, 2016).	International Monetary Fund, International Financial Statistics and data files using World Bank data on the GDP deflator.	FR.INR.RI NR
Unemployment	Unemployment, total (% of total labour force) (modelled ILO estimate)	Unemployment refers to the share of the labour force that is without work but available for and seeking employment (World Bank, 2016). The unemployment rate is therefore the number of people unemployed relative to the total labour force available for employment.	International Labour Organization	SL.UEM.T OTL.ZS
Domestic Credit	Domestic credit to private sector (% of GDP)	Domestic credit to private sector refers to financial resources provided to the private sector by financial corporations, such as through loans, purchases of non-equity securities, and trade credits and other accounts receivable, that establish a claim for repayment. For some countries, these claims include credit to public enterprises. The financial corporations include monetary authorities and deposit money banks, as well as other financial corporations where data are available (including corporations that do not accept transferable deposits but do incur such liabilities as time and savings deposits). Examples of other financial corporations are finance and leasing companies, money lenders, insurance corporations, pension funds, and foreign exchange companies (World Bank, 2016).	International Monetary Fund, International Financial Statistics and data files, and World Bank and OECD GDP estimates.	FS.AST.P RVT.GD.ZS
Trade	Merchandise trade (% of GDP)	Merchandise trade as a share of GDP is the sum of merchandise exports and imports divided by the value of GDP, all in current U.S. dollars (World Bank, 2016).	World Trade Organization, and World Bank GDP estimates.	TG.VAL.T OTL.GD.ZS
<i>Social Variables</i>				
Probability of Loss	Urban population (% of total)	Urban population refers to people living in urban areas as defined by national statistical offices. The data are collected and smoothed by United Nations Population Division (World Bank, 2016).	United Nations, World Urbanization Prospects.	SP.URB.T OTL.IN.ZS