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A STUDY OF MACRO DETERMINANTS OF LIFE INSURANCE CONSUMPTION IN ZAMBIA

Moses Kanyanta Musonda[1] and Taonaziso Chowa[2]

Moses Kanyanta Musonda is currently pursuing a masters degree program in management strategy at the university of Zambia, Zambia. E-mail: kmusonda1@yahoo.com
Taonaziso Chowa is currently a lecturer in the department of mathematics and statistics, school of natural sciences at the university of Zambia, Zambia. Email: taonaziso.chowa@unza.zm

KeyWords
Determinants, demographic, domestic savings, financial development, income, inflation, interest rates, life insurance, life expectancy, level of education, macro, socio-economic, social security, old dependency, urbanization, university of Zambia, young dependency.

ABSTRACT

Despite posting higher average real growth in the period 1999 to 2018, Zambian's life insurance sub-sector's contribution to the Zambian economy still remains inadequate. Consumption of life insurance in Zambia was not high enough to support the generation of adequate premiums and improve the subsector's contribution to the economy. The study investigated macro variables that determined the consumption of life insurance in Zambia. The study took a descriptive research approach, and employed a quantitative research design. To this effect, the study used time-series secondary data the period 1990 – 2019 resulting in a sample size of 30 years. Multiple linear regression analysis was used to analyse the times-series data to determine which macro variables had a significant relationship with the consumption of life insurance. Results showed that out of the five (5) independent variables included in the multiple linear regression model, Financial Development, Domestic Savings, Inflation, Young Dependency and Social Security, only Young Dependency and Social Security had significant relationships with life insurance consumption. It was therefore concluded that Young Dependency and Social Security were significant macro determinants of life insurance consumption in Zambia. The study further concluded that Young Dependency and Social Security each had a negative relationship with consumption of life insurance. In a lower middle-income country like Zambia, high young dependency resulted in citizens not being able to satisfy their current needs to think about life insurance. High young dependency rendered income insufficient to buy life insurance. Increased access to social security reduced the need to buy pension products from the life insurance sub-sector. Social security displaced life insurance. Lastly, the study recommended; the formulation and implementation of deliberate policies that support job creation, making having life insurance mandatory, and pricing life insurance products to accommodate individuals in lower income brackets, as ways to increase consumption of life insurance in Zambia.

Introduction

The Zambian government and other stakeholders had in the past years taken deliberate action intended to enhance the contribution of the overall financial sector, including insurance, to Zambia's economic development. Among actions include the formulation and implementation of; the 2004 – 2009 and 2010 - 2015 Financial Sector Development Plans (FSDPs), 2017-2022 National Financial Inclusion Strategy, 2012-2017 National Strategy on Financial Education for Zambia and the 2017 National Financial Sector Development Policy (NFSDP). The aforementioned plans were anchored on findings presented in the Finscope Zambia 2009 and 2015 Surveys.
The Finscope surveys provided some important insights upon which government based its plans for developing the insurance sector. However, the surveys focused on the financial sector as a whole, with the aim of tracking overall trends in national financial inclusion. As such, the insurance sector was considered as a mere part of the larger financial sector thereby increasing the chances of drawing of generic rather than life insurance sub-sector specific conclusions. Nevertheless, the implementation of the initiatives like the annual financial literacy week may had contributed to the growth in life insurance premiums witnessed in the recent past.
Zambia's life insurance sub-sector had been on a steady, upward trajectory. Between 1999 and 2018, the sub-sector recorded an annual average real growth of 6.15% in premiums. The average real growth recorded for the life insurance exceeded the 4.93% average

real growth recorded for the non-life insurance sub-sector. On a continental and global level, Zambia's life insurance premiums achieved higher average real growth compared to 3.77% and 2.16% for Africa and the World respectively.
Although the life insurance achieved higher average real growth per annum than non-life, in the period 1999 to 2018, the size of the life insurance sub-sector remained smaller than the non-life insurance sub-sector. As at 2018, the size of Zambia's insurance sector, measured by Gross Written Premium (GWP), was $266.91 million, to which life insurance contributed $106.94 million (40%) and non-life insurance contributed $159.97 million (60%). In 2019, the size of life insurance sub-sector, as measured by gross written premiums, stood at $104.23 million representing only 39% of the Zambia's $262.32 million insurance sector (PIA, 2020). The Life insurance sub-sector's contribution to the overall insurance sector averaged 33% per annum in the period 2011 to 2018 which was lower than 76% recorded for the SADC region. Figure 1.1 below shows the contribution by each insurance sub-sector for Zambia and SADC respectively, from 2011 to 2018.

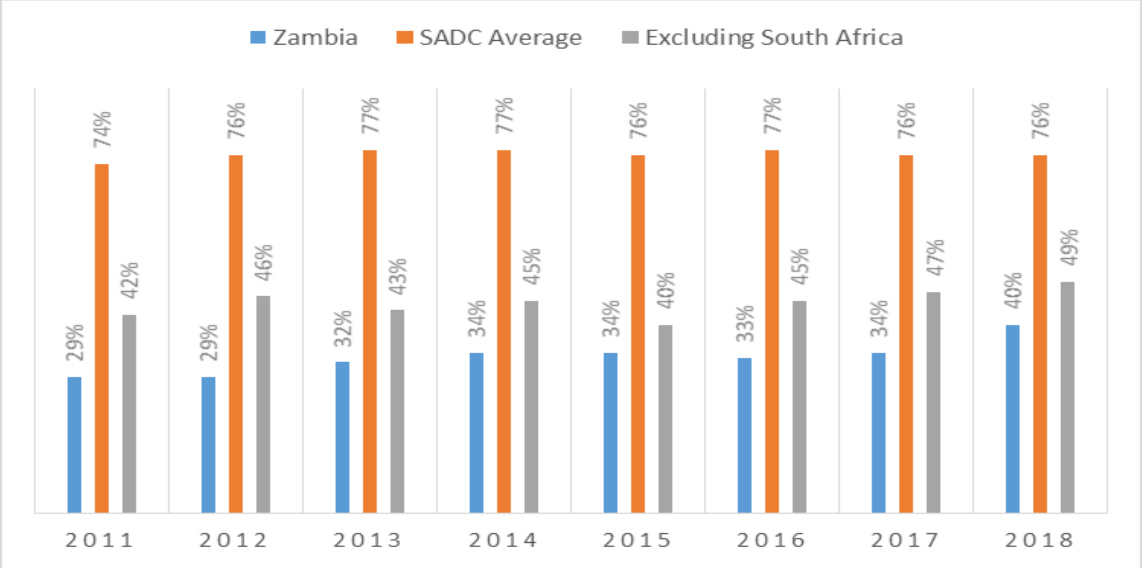

Figure 1.1: Life insurance premium contribution to overall insurance premium Zambia versus SADC based on PIA and CISNA Annual Reports
(Source: by Author)

Zambia's Life insurance sub-sector remained under-developed relative to the non-life sub-sector and life insurance sub-sector both at regional and world level. Measured by the penetration rate - the ratio of insurance premiums to the Gross Domestic Product (GDP) – the level of development of the insurance sector in 2019 stood at 1.2% (Sigma, 2020). Of this penetration rate, 0.8% was for non-life insurance while 0.4% was for life insurance. The life insurance penetration rate recorded was lower than the Africa and World life insurance penetration rates of 1.9% and 3.2% respectively.
The Zambian government had over the years formulated and implemented plans (2004 – 2009) and 2010 - 2015 Financial Sector Development Plans (FSDPs), 2017-2022 National Financial Inclusion Strategy, 2012-2017 National Strategy on Financial Education for Zambia and the 2017 National Financial Sector Development Policy (NFSDP), to enhance the consumption of life insurance. However, these plans were anchored on the Finscope surveys whose main focus was on the overall financial sector and considered the insurance sector as a whole. Anchoring strategies on the Finscope surveys meant the plans to enhance life insurance consumption were based on general factors of insurance. Until specific determinants of life insurance consumption are determined and considered in the formulation of sub-sector specific plan, the life insurance sector's contribution to Zambian's economy may continue to be low. This study investigated macro variables that determine the consumption of life insurance in Zambia.

1.1 Objectives and organization of the Paper

The objective of the study was to investigate macro variables that determine the consumption of life insurance in Zambia. To achieve the objective, the paper sought to answer two questions;

1. What are the macro determinants of life insurance consumption in Zambia?
2. What is the relationship between the macro determinants of life insurance and the consumption of life insurance Zambia?

The first part of the paper gave an overview of life insrance penetration in Zambia with relative to the SADC region and the globe. The second section reviews both theoretical and empirical studies pertaining to macro variables that affect consumption of life insurance, and highlights gaps in the reviewed literature. The third section outlines the conceptual framework of the study and explains how the variables were expected to interact. The fourth section gives details of the tools that were used to gather the necessary da-

ta, how the variables were measured, and how the data was collected and presented for analysis. The fifth section gives details of the data analysis and discusses the findings. The sixth section gives answers to the research questions, and makes recommendations of the research.

2.0 Literature Review

2.1 Models of Life Insurance Consumption

Models of life insurance consumption including; Yaari's model, Pissarides' model, and Lewis's model. According to Yaari's model, uncertainty about the time of death, and the individual's desire to leave an inheritance positively influences life insurance consumption while the wealth of an individual negatively influences life insurance consumption. Extending on Yaari's model, Pissarides's model posits that, in addition to the desire to leave an inheritance, individuals also desire to save for retirement and as such they buy life insurance to save for retirement. Lewis' model expanded upon Yaari's and Pissarides' models, and concluded that consumption of life insurance rises with the probability of primary income-earner's death, the present value of consumption by the beneficiaries, and the relative risk aversion of the beneficiaries; and declines with the household's net-wealth and the price of insurance. The models propagate that life insurance consumption is determined by; probability of primary income-earner's death, desire to leave an adequate inheritance, saving for retirement, present value of consumption by the beneficiaries, relative risk aversion of the beneficiaries; household net-wealth, and price of life insurance. In the context of empirical studies, the aforesaid determinants were operationalized by means of proxy variables (Browne & Kim, 1993).

2.2 Macro Determinants of Life Insurance Consumption

A number of macro determinants of life insurance consumption have been considered in different empirical studies. However, different and many, determinants were generally categorized into five; macroeconomic, demographic, psychological, institutional and life insurer action parameters (Shlag, 2003). Empirical literature indicated that determinants across all the respective categories had never been considered in a single study. Some studies had however, attempted to examine combinations of determinants from two or more categories. A few studies had gone further to not only consider determinants from the different categories, but also identify which category was more significant in determining life insurance consumption. Alhassan & Biekpe (2016), Iyawe & Osamwonyi, (2017), Satrovic & Muslija (2018), provided clarity and focus with regard to what macro-level determinants of life insurance consumption to consider. Socio-economic and demographic factors were not only the most commonly examined but were also found to be more robust predicators of life insurance consumption.

2.2.1 Socio-economic Determinants of Life Insurance Consumption

Effects of socio-economic determinants and their relationship with life insurance consumption are outlined in a number of empirical studies. Prominent and common among determinants outlined in the literature were; income, financial development, inflation, interest rate, domestic savings, and social security.

2.2.1.1 Income

Income is the most critical component in any consumption transaction. Income gives consumers the ability to acquire a desired good, in this case life insurance. Emamgholipour & Mohajerzadeh (2017), Iyawe & Osamwonyi, (2017), Alhassan & Biekpe (2016), Aman (2016), Guerineau & Sawadogo (2015), and Sarkodie & Yusif (2015) found indicated the existence of a positive relationship between income and life insurance consumption. However, Nkotsoe (2018) and Mulenga (2019) established that the relationship between income and life insurance consumption was insignificant. As incomes increased, it was expected that consumption of life insurance would also increase.

2.2.1.2 Financial Development

A developed financial system that facilitates citizen's participation in the financial sector was expected to contribute positively to increasing consumption of life insurance (Alhassan & Biekpe, 2016; Iyawe & Osamwonyi, 2017). However, Mulenga (2019) found that as Zambia's financial sector grew, consumption of life insurance shrunk. On the other hand, results from Nkotsoe (2018), Guerineau & Sawadogo (2015) and Kjoveski (2012) found no relationship between financial development and life insurance consumption.

2.2.1.3 Inflation

Inflation erodes the purchasing power in an economy, resulting in individuals not having enough purchasing power left to acquire life insurance. Finding by Iyawe & Osamwonyi (2017), Alhassan & Biekpe (2016), and Olayungbo & Akinlo (2016) indicated the existence of a negative relationship between inflation and life insurance consumption. However, Mulenga (2019) found that inflation had a positive effect on life insurance consumption.

2.2.1.4 Interest Rates

The effect of interest rates on life insurance consumption was considered from two vantage points, interest rates offered by alternative investment vehicles from one point, and interest rates offered by life insurance products, if any, from the other. Interest rates offered by alternative investment vehicles offer direct substitute for life insurance. Beck & Webb (2003) concluded that a higher real interest rates were associated negatively and significantly associated with higher life insurance consumption. However, Guerineau & Sawadogo (2015) and Kjoveski (2012) established that the relationship was insignificant. Iyawe & Osamwonyi (2017) concluded that interest rates had a negative yet insignificant effect on life insurance demand in Sub-Sahara Africa.

2.2.1.5 Domestic Savings

Life insurance, having a savings aspect, was considered to be a sub-component of private savings in an economy. It was therefore expected that savings would support the consumption of life insurance. Schwebler (1984) found to have a significantly positive with life insurance consumption. Beck & Webb (2003) found that a higher private savings rate was associated with higher life insurance consumption across countries.

2.2.1.6 Social security

Nkotsoe (2018) found that social security was significant in explaining life insurance consumption in SADC. Social security was seen as a direct substitute for life insurance. Beenstock, Dickinson & Khajuria (1986) found that government social transfer payments displaced demand for private insurance. Alhassan & Biekpe (2016) and Kjoveski (2012) found that social security had a significant positive impact on life insurance consumption.

2.2.2 Demographic Determinants of Life Insurance Consumption

Demographic determinants of life insurance consumption had been widely studied by a number of scholars. Prominent and common demographic determinants outlined in the literature were; life expectancy, old dependency, young dependency, level of education and urbanization.

2.2.2.1 Life Expectancy

How long an individual expects to live is a critical ingredient is the decision to consume or not consume life insurance. A high life expectancy is expected to adversely affect the consumption of life insurance. The expectation of a negative relationship was supported by findings in Alhassan & Biekpe (2016), Alhassan & Biekpe (2016) and Guerineau & Sawadogo (2015) who established that life expectancy had a negative impact on life insurance consumption. Aman (2016) could not however establish the existence of the negative relationship. Beck & Webb (2003) and Browne & Kim (1993) found that average life expectancy had no significant contribution to explaining the demand for life insurance.

2.2.2.2 Old Dependency

Old dependency supported consumption of life insurance in a country. According to Guerineau & Sawadogo (2015) demand for life insurance increased with the aging population verified with the development of life insurance in developed countries. Beck & Webb (2003) found that a higher ratio of old to working-age population increased life insurance consumption. However, Guerineau & Sawadogo (2015) and Kjoveski (2012) found no conclusive relationship between the old dependency and life insurance consumption.

2.2.2.3 Young Dependency

Young dependency was a significant contributor to explaining the consumption of life insurance. An individual who had young people under their care would want to consume life insurance as a means of protecting their young dependents against financial hardships in case the individual passes on or loses his or her source of income. Zhuo (1998) found that the dependency ratio of the children had a significant influence on demand for life insurance policies. Contrary, Kjoveski (2012) and Beck & Webb (2003) could not find a significant relationship between young dependency and life insurance.

2.2.2.4 Level of Education

Education was seen as a critical contributor to explaining life insurance consumption (Ćurak, Džaja & Pepur, 2013; Browne & Kim, 1993). High levels of education were believed to lead to greater awareness and understanding of the role of life insurance, which in turn led to increased demand for life insurance. According to Emamgholipour & Mohajerzadeh (2017), to increase life insurance consumption, it was necessary to improve the education status of the people. To the contrary, Nkotsoe (2018) and Beck & Webb (2003)

did not establish the significance of the influence of education on the consumption of life insurance.

2.2.2.5 Urbanization

A higher degree of urbanization was likely to increase life insurance sales. As economies experience a shift in activities from agricultural to industry, the number of children may decline because of the high costs of raising children in the urban setting. The reduced number of children resulted in reduced expenditure on children which increased the ability to accumulate savings funds which could be invested in life insurance policy (Hwang & Gao, 2003).

2.3 Gaps in the Literature

The coverage of independent variables was narrow in most studies. No single study operationalized and considered all key socio-economic and demographic determinants of life insurance as highlighted in the literature. Furthermore, the geographical coverage of majority of the studies was regional with only a few being country specific. Despite the differences in geographical coverage, most country studies employed linear regression as a means of data analysis. This method of data analysis could be considered more suited to country-specific studies.

The operationalization of some variables differed from study to study. Life insurance consumption was operationalized using penetration in some studies and as density in others. Other studies used both life insurance penetration and life insurance density as a measure of life insurance consumption. In a similar vein, while some studies measurements separated between young dependency and old dependency, others combined the two variables. Young and old dependants may have different needs and demands on the breadwinner and as such may have differing implication on life insurance consumption.

3.0 Theoretical and Conceptual Framework

The conceptual framework of this study was developed based on the two main categories of determinants of life insurance consumption stated in literature; Socio-economic and demographic. Literature suggested; income, financial development, domestic savings, inflation, interest rates, social security, life expectancy, young dependency, old dependency, level of education, and urbanization as the general determinants of life insurance consumption. The study incorporated all these eleven (11) determinants stated in the literature, and developed the following conceptual framework in Figure 3.2.

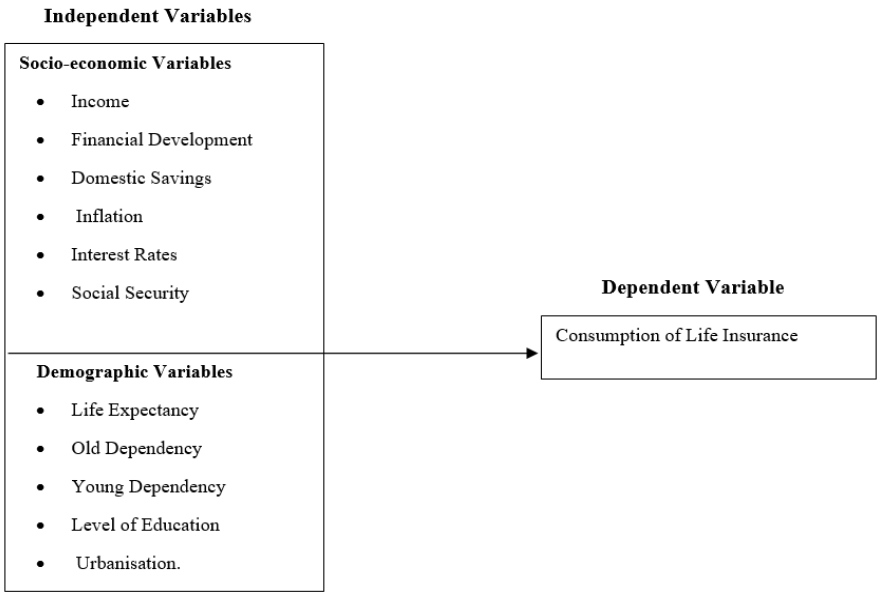

Figure 3.2: Conceptual framework of the study

(Source: by Author)

Income, financial development, domestic savings, old dependency, young dependency, level of education, and urbanization were expected to positively affect the life insurance consumption. On the other hand, inflation, interest rates, social security, and life expectancy were expected to negatively affect the life insurance consumption.

4.0 Research Methodology

Research Approach and Design: The study took a descriptive research approach and employed a quantitative research design. Given that the dependent and independent variables covered in the study could be best measured quantitatively, a quantitative design was best suited to the study.

Data Collection: Aggregate annual time-series secondary data was collected from various sources in line with similar studies. The data was collected from publication by World Bank, International Monetary Fund (IMF), and Swiss Re. Time-series data was for the period from the year 1990 through to 2019. Additionally, Zambia became a multi-party democratic state in 1990, and began to liberalize its economy. This basis was used in Ibiwoye, Ideji & Oke (2010) and Hwang & Gao (2003).

Sample Size: The consideration of the period 1990 - 2019 resulted in a sample size of 30 years from a target population of 58 years of Zambia's existence (1964 - 2022). In addition, the sample size met the 30 observations minimum required for statistical analysis, and was close to the size (35) used in a similar study (Aman, 2016).

Measurement of Variables: The dependent variable Life insurance consumption was measured as total life insurance premiums as a percentage of Gross Domestic Product (GDP). Income was measured as GDP as a percentage of total population, financial development as the ratio of broad money (M2) to GDP, inflation as changes in the Consumer Price Index (CPI), interest rated as average interest rates on deposits adjusted for inflation, domestic savings as gross domestic savings as a percentage of GDP, social security as spending on healthcare goods and services (excluding capital health expenditures) as a percentage of GDP. Life expectancy was measured as an index using a minimum value of 20 years and a maximum value of 85 years, old dependency as the population over 65 years as a percentage of working population, young dependency as the population under 15 years as a percentage of working population, level of education as the average number of years of education received by people ages 25 and older converted from education attainment levels using official durations of each level (World Bank, 2021). Urbanization was measured as urban population as a percentage of the total population.

Methods of Data Analysis: As with similar studies Aman (2016), Hwang & Gao (2003), and Lim & Haberman (2003), the study used multiple linear regression analysis to analyse the times-series data.

The multiple linear regression model was represented by the equation;

$$LIPt = \beta 0 + \beta 1It + \beta 2FDt + \beta 3DSt + \beta 4INFt + \beta 5IRt + \beta 6EDt + \beta 7UBt + \beta 8ODt + \beta 9YDt + \beta 10LEt + \beta 11SSt + \varepsilon$$

where;
$\beta 0$ = Constant term
$LIPt$ = Life Insurance Penetration at time period t
It = Per Capita Income at time period t
FDt = Level of Financial Development at time period t
DSt = Domestic Savings at time period t
$INFt$ = Inflation at time period t
IRt = Interest Rate at time period t
EDt = Level of Education at time period t
UBt = Urbanization at time period t
ODt = Old Dependency at time period t
YDt = Young Dependency at time period t
LEt = Life Expectancy at time period t
SSt = Social Security Spending at time period t
ε = Error Margin
$\beta 1$ - $\beta 11$ = Coefficients

To ensure reliability and validity of regression analysis, the data was tested for several linear regression assumptions before final analysis. Furthermore, the multiple linear regression model was tested for statistical significance using Analysis of Variance (ANOVA).

Data Processing: Time-series data was processed and analysed using the Statistical Package for Social Sciences (SPSS) and Microsoft Excel.

5.0 Analysis and Discussion of Findings

Table 5.1 presents a summary of descriptive statistics of the dependent and inde-pendent variables for the time series data.

Variable	Range	Minimum	Maximum	Mean	Std. Deviation	Skewness
Life Insurance Penetration	0.3%	0.2%	0.5%	0.3%	0.1%	0.2
GDP Per Capita (K)	3,582.12	4,277.45	7,859.57	5,877.63	1,343.80	0.4
Broad Money Supply to GDP	12.2%	13.6%	25.8%	19.0%	2.9%	0.3

Gross National Savings to GDP	41.6%	-0.3%	41.3%	24.7%	13.6%	-0.4
Consumer Price Index	176.7%	6.6%	183.3%	34.2%	45.3%	2.4
Interest rate on Deposits	81.6%	6.5%	88.1%	20.2%	17.9%	2.2
Mean Years of Schooling (Years)	2.50	4.70	7.20	6.24	0.62	-0.6
Urban Population	9.3%	34.8%	44.1%	38.6%	2.7%	0.5
Old Dependency ratio	1.1%	4.0%	5.1%	4.5%	0.4%	0.1
Young Dependency ratio	11.0%	83.2%	94.2%	91.5%	2.7%	-1.8
Life Expectancy	20.5	43.4	63.9	51.5	7.3	0.5
Current Health Expenditure to GDP	5.0%	2.2%	7.2%	4.7%	1.4%	0.4

Table 5.1: Descriptive statistics for the time-series data

(Source: SPSS Output)

5.1 Multiple Linear Regression Analysis

Before estimating the linear regression final regression model, tests for linear regression assumptions were conducted on the tine series data. Only independent variables that met all the linear regression assumptions were included in the final model (refer to appendices for test results). Before tests for linear regression assumptions, a model that included all the independent variables had a p-value of 0.003, a coefficient of determination (R Square) of 0.731, and a correlation coefficient of 0.855. The model was therefore significant, with independent variables in the model explaining 73.1% of variations in the dependent variable.
Tables 5.2 and 5.3 below show the model summary and ANOVA respectively, before the tests for linear regression assumptions.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.855[a]	.731	.567	.000573	2.211

a. Predictors: (Constant), SS, FD, ED, YD, IR, UB, DS, INF, I, OD, LE

b. Dependent Variable: LIP

Table 5.2: Model summary before tests for linear regression assumptions

(Source: SPSS Output)

Model	Sum of Squares	Df	Mean Square	F	p-value
Regression	.000	11	.000	4.449	.003[b]
Residual	.000	18	.000		
Total	.000	29			

a. Dependent Variable: LIP

b. Predictors: (Constant), SS, FD, ED, YD, IR, UB, DS, INF, I, OD, LE

Table 5.3: ANOVA results before tests for linear regression assumptions

(Source: SPSS Output)

The following estimated regression equation was developed as the initial model;

$$LIPt = 0.005 - 5.287It - 0.047FDt + 0.486DSt + 0.721INFt - 0.785IRt + 0.661EDt - 4.306UBt + 2.306ODt - 0.473YDt + 10.082LEt - 1.396SSt + 0.024$$

The t-statistics and p-values showed that variables; GDP per capita (I), urbanization (UB), life expectancy (LE) and ratio of current health expenditure to GDP (SS) were statistically significant at 5, 5, 5 and 1 percent significance levels respectively. Coefficients for GDP per capita, urbanization, life expectancy and ratio of current health expenditure to GDP were statistically significant at 0.07, 0.07, 0.08 and 0.001 significance levels respectively.

Data was tested for multicollinearity. Data for highly correlated variables was checked for duplication, no duplication was found. Furthermore, no well-grounded basis existed for the aggregation of affected independent variables. To this effect, the option to remove the affected variables was adopted as was the case in a similar study by Aman (2016). Conditions for removal were; (i) variable highly correlated with more than one other independent variable, (ii) one of the independent variables positively and highly correlated with each other, and (iii) operationalized by indicators that can be explained by another variable still included in the model, variable whose removal would not make the overall multiple regression model insignificant.

Variables that met the stated conditions were isolated through an examination of the bivariate correlation for all the independent variables. After the variables were removed from the model, the number of independent variables was reduced from eleven (11) to five (5) independent variables. Therefore, the initial model was reduced to;

$$LIPt = \beta 0 + \beta 1FDt + \beta 2DSt + \beta 3INFt + \beta 4YDt + \beta 5SSt + \varepsilon$$

The summary of the reduced model and ANOVA results are presented in Tables 5.4 and 5.5 respectively below.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.739[a]	.547	.452	.000645

Table 5.4: Summary of the reduced regression model

(Source: SPSS Output)

Model	Sum of Squares	Df	Mean Square	F	p-value
Regression	.000	5	.000	5.788	.001[b]
Residual	.000	24	.000		
Total	.000	29			

Table 5.5: ANOVA table for the reduced model

(Source: SPSS Output)

The reduced model was summarized in the equation;

$$LIPt = 0.014 + 0.258FDt - 0.283DSt - 0.292INFt - 0.350YDt - 0.592SSt + 0.006$$

Multiple linear regression coefficients and their respective p-values for independent variables in the reduced model are given in Table 5.6 below.

Model	Unstandardized Coefficients		Standardized Coefficients	t	p-value
	B	Std. Error	Beta		
(Constant)	.014	.006		2.521	.019
FD	.008	.006	.258	1.363	.186
DS	-.002	.001	-.283	-1.453	.159
INF	-.001	.000	-.292	-1.549	.134
YD	-.011	.006	-.350	-2.012	.050

SS	-.037	.010	-.592	-3.747	.001

Table 5.6: Multiple linear regression coefficients for independent variables in the reduced model.

(Source: SPSS Output)

The reduced model had a Correlation coefficient (R) of 0.739. A Coefficient of de-termination (R-squared) of 0.547 or 54.7%, with a p-value of 0.001. The ratio of Broad Money Supply to GDP had coefficient of 0.258 with a p-value of 0.186 which was greater than α = 0.05. Gross National Savings to GDP had coefficient of -0.283 with a p-value of 0.159 which was greater than α = 0.05. Consumer Price Index had coefficient of -0.292 with a p-value of 0.134 which was greater than α = 0.05. Young Dependency ratio had coefficient of -0.350 with a p-value of 0.05 which was equal to α = 0.05. Current Health Expenditure to GDP had coefficient of -0.592 with a p-value of 0.001 which was less than α = 0.05.

5.2 Discussion of Results

GDP Per Capita, Mean Years of Schooling, Urban Population, Old Dependency ratio, and Life Expectancy data could not satisfy the assumption of non-multicollinearity, to this effect these variables were removed from the multiple linear regression model. Interest Rate on Deposits and Consumer Price Index data was positively and highly correlated. Interest Rates on Deposits represented all deposits including bank savings ac-counts and was therefore considered to be a component of Gross National Savings (World Bank, 2021). With Gross National Savings still included in the multiple linear regression model, effects of Interest Rate on Deposits could be represented by the ratio of Gross National Savings to GDP at a higher level. As a result, Interest Rates on Deposits was removed from the model and Consumer Price Index maintained. Variable removed from the model operationalized Income, Interest Rate, Education, Urbanization, Old Dependency, and Life Expectancy. The multiple linear regression model was reduced to just five (5) independent variables Broad Money Supply to GDP, ratio of Gross National Savings to GDP, Consumer Price Index, Young Dependency ratio, and ratio of Current Health Expenditure to GDP which operationalized Financial Development, Domestic Savings, Inflation, Young Dependency and Social Security respectively.

The multiple linear regression analysis results showed that a strong correlation existed between the dependant variable and the independent variables. Independent variables explained 54.7% of the variations in the life insurance penetration rate. The model's p-value of 0.001 which was less than the 0.05 significance level indicated that the multiple linear regression model was significant. To this effect, the model's results could be relied upon with a 95% level of confidence.

Financial Development, operationalized as ratio of Broad Money Supply to GDP, had a statistically insignificant relationship with life insurance consumption. A multiple linear regression coefficient of 0.258 indicated that ratio of Broad Money Supply to GDP moved in the same direction with Life Insurance Penetration Rate. For every unit increase in the ratio of Broad Money Supply to GDP, Life Insurance Penetration Rate was expected to increase 0.258 times. However, a p-value of 0.186, which was greater than α = 0.05, indicated that the positive relationship between the two variables was not statistically significant. It was therefore concluded, based on the multiple linear regression analysis, that Financial Development was not a significant determinant of life insurance consumption. This result agreed with previous re-search findings by Guerineau & Sawadogo (2015) and Kjoveski (2012).

Domestic Savings, operationalized as ratio of Gross National Savings to GDP, had a statistically insignificant relationship with life insurance consumption. A multiple linear regression coefficient of -0.283 indicated that ratio of Gross National Savings to GDP moved in opposite direction with Life Insurance Penetration Rate. For every unit in-crease in the ratio of Gross National Savings to GDP, Life Insurance Penetration Rate was expected to decrease 0.283 times. However, a p-value of 0.159, which was greater than α = 0.05, indicated that the inverse relationship between the two variables was not statistically significant. It was therefore concluded, based on the multiple linear regression analysis, that Domestic Savings was not a significant determinant of life insurance consumption. While the result agreed with previous research findings by Ibiwoye, Ideji & Oke (2010) on the direction of the relation-ship, it differed on the significance of the relationship. Ibiwoye, Ideji & Oke (2010) found a negative significant relationship between life insurance consumption and domestic savings.

Inflation, operationalized as changes in CPI, had a statistically insignificant relationship with life insurance consumption. A multiple linear regression coefficient of -0.292 indicated that changes in CPI moved in opposite direction with life insurance penetration rate. For every unit increase in CPI, Life Insurance Penetration Rate was expected to decrease 0.292 times. However, a p-value of 0.134, which is greater than α = 0.05, indicated that the relationship between the two variables was not statistically significant. Changes in CPI had no significant effect on Life Insurance Penetration Rate. It was therefore concluded, based on the multiple linear regression analysis, that Inflation was not a significant determinant of life insurance consumption. This result agreed with previous research findings by Iyawe & Osamwonyi (2017), Kjosevski (2012) and Hwang & Gao (2003).

Young Dependency, operationalized as Young Dependency ratio, had a statistically significant relationship with life insurance consumption. A multiple linear regression coefficient of -0.350 indicated that Young Dependency ratio moved in opposite direction with life insurance penetration rate. For every unit increase in Young Dependency ratio, Life Insurance Penetration Rate was expected to decrease 0.35 times. A p-value of 0.05, which was equal to α = 0.05, indicated that the relationship between the two variables was statistically significant. It was therefore concluded, based on the multiple linear regression analysis, that Young Dependency was a significant determinant of life insurance consumption. As the number of young people depending on working individuals increased,

consumption of life insurance decreased. This result agreed with previous research findings by Guerineau & Sawadogo (2015). High young dependency resulted in households with low income not being able to satisfy current needs and thus not think about buying life insurance.

Social Security, operationalized as ratio of Current Health Expenditure to GDP, had a statistically significant relationship with life insurance consumption. A multiple linear regression coefficient of -0.592 indicated that ratio of Current Health Expenditure to GDP moved in opposite direction with life insurance penetration rate. For every unit increase in ratio of Current Health Expenditure to GDP, Life Insurance Penetration Rate was expected to decrease 0.592 times. A p-value of 0.001, which was less than $\alpha = 0.05$, indicated that the inverse relationship between the two variables was statistically significant. It was therefore concluded, based on the multiple linear regression analysis, that Social Security was a significant determinant of life insurance consumption. This result agreed with previous research findings by Beenstock, Dickinson & Khajuria (1986).

6.0 Conclusion

The primary objective of the study was to investigate macro variables that deter-mine the consumption of life insurance in Zambia. The research had two specific objectives which were; to determine the macro determinants of life insurance consumption in Zambia, and to describe the relationship between macro determinants of life insurance and the consumption of life insurance in Zambia. Results showed that out of the five (5) independent variables included in the multiple linear regression model, only Young Dependency and Social Security had significant relationships with life insurance consumption. It was therefore concluded based on multiple linear regression analysis that Young Dependency and Social Security were significant macro determinants of life insurance consumption in Zambia. The results showed that both young dependency and social security had a negative relationship with consumption of life insurance. Young dependency and life insurance consumption move in opposite directions. When one increases, the other decreases, and vice versa. High young dependency put pressure on available in-come which led to the unavailability of money to buy life insurance. In a lower middle- income country like Zambia, high young dependency resulted in citizens not being able to satisfy their current needs to think about life insurance. High young de-pendency rendered income insufficient to buy life insurance. Social security and life insurance consumption moved in opposite directions. Increased access to social security reduced the need to buy pension products from the life insurance sub-sector. Social security displaced life insurance.

7.0 Recommendations and Limitations

In order to increase consumption of life insurance in Zambia, the study recommended that

- Policy makers formulate and implement deliberate that support job creation. By having more people in employment, more people will have a regular source of income. The increased number of people with a regular income is more likely to reduce demands on the current incomes, as young dependants will have a number of income earners to look to for support. With reduced demands on their incomes, individuals will have some funds left to buy life insurance.
- Government makes having life insurance mandatory for those on a regular salary, just as is the case with pension schemes and motor vehicle insurance. By so doing, individuals will be compelled to buy life insurance. This to a larger extent, will mitigate the displacement effect that social security programs have on life insurance products.
- Life insurance companies design and price life insurance products at points that even low-income earners may be able to buy. In addition, the companies should ensure prices of the products are communicated to the public to aid their decision making with regard to buying life insurance.

The study only investigated the demand-side determinants of life insurance, with specific focus on socio-economic and demographic determinants. The research did not cover supply-side determinants. Future studies should focus on studying other determinants of life insirance consumption. Furthermore, research should also focus on the supply side of life insurance and how it affects the consumption of life insurance in Zambia. The research should take into consideration the life insurers' actions with respect to product development, pricing, sales strategies among other actions that may affect life insurance consumption.

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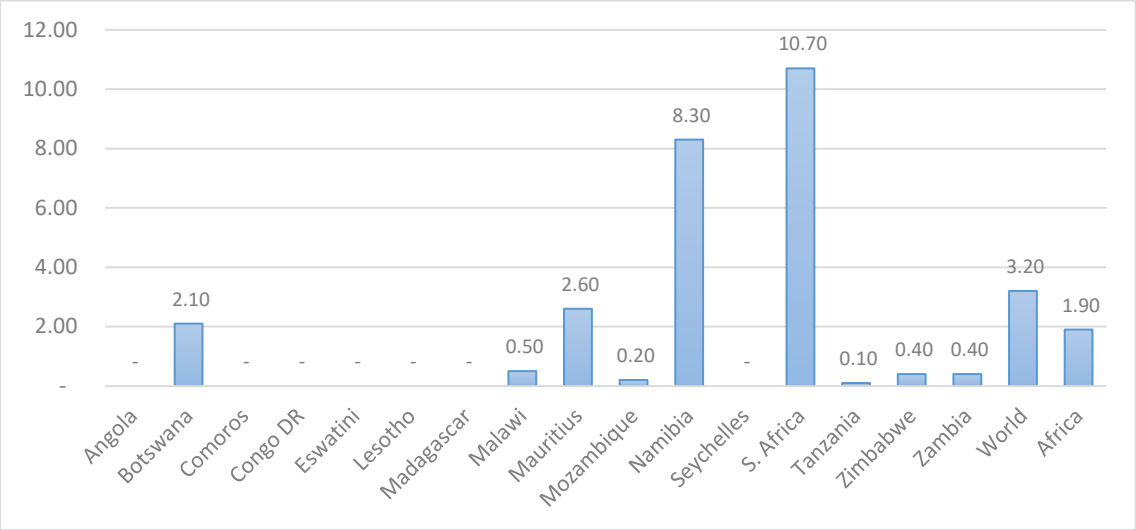
Appendices

Appendix I: 2019 Life insurance premium to GDP (%) for SADC countries based on Sigma data from Swiss Re. (-) indicates missing data

(Source: SPSS Output)



Appendix II: Multiple linear regression coefficients and Collinearity statistics before linear regression assumption tests

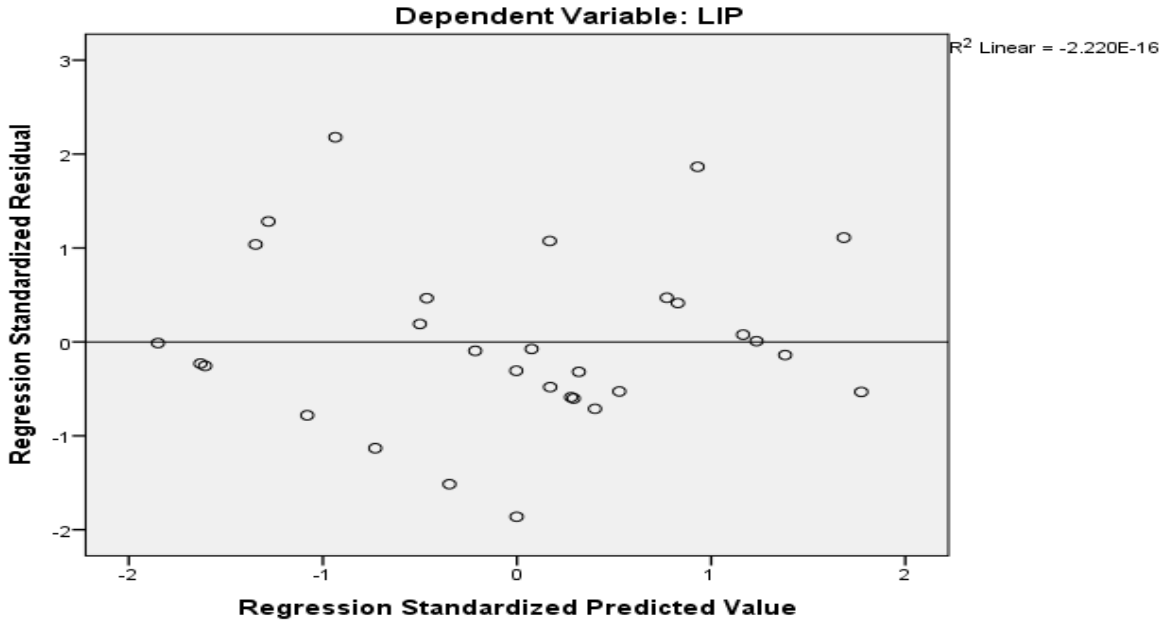
(Source: SPSS Output)

Model		Unstandardized Coefficients		Standardized Coefficients	t	p-value	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.005	.024		.202	.842		
	I	-3.427E-006	.000	-5.287	-2.447	.025	.003	312.443
	FD	-.001	.010	-.047	-.144	.887	.141	7.080
	DS	.003	.003	.486	1.072	.298	.073	13.792
	INF	.001	.001	.721	1.304	.209	.049	20.500
	IR	-.004	.003	-.785	-1.461	.161	.052	19.334
	ED	.001	.001	.661	.769	.452	.020	49.489
	UB	-.141	.056	-4.306	-2.521	.021	.005	195.273
	OD	.511	.377	2.306	1.356	.192	.005	193.608
	YD	-.015	.012	-.473	-1.335	.198	.119	8.406
	LE	.001	.000	10.082	2.626	.017	.001	986.366
	SS	-.086	.019	-1.396	-4.471	.000	.153	6.529

a. Dependent Variable: LIP

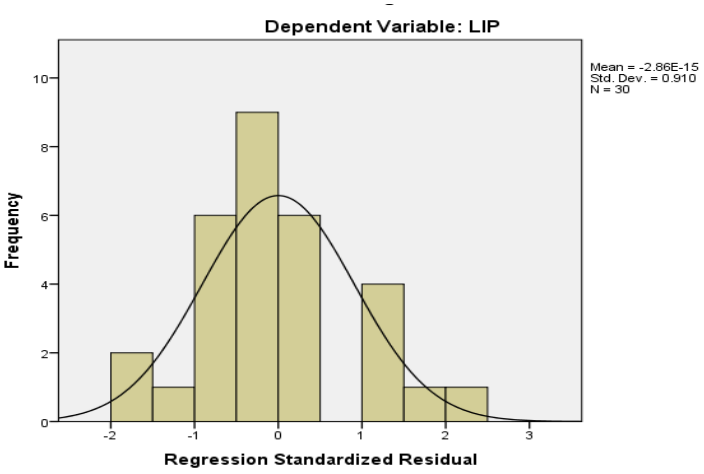
Appendix III: Test for Linearity - Residual scatterplot.

(Source: SPSS Output)



Appendix IV: Test for Normality - Residual Histogram

(Source: SPSS Output)



Appendix V: Test for Homoscedasticity - Pearson's Correlation

(Source: SPSS Output)

		Standardized Predicted Value	ABS_ZRE_1
Standardized Predicted Value	Pearson Correlation	1	-.153
	p-value (2-tailed)		.419
	N	30	30
ABS_ZRE_1	Pearson Correlation	-.153	1
	p-value (2-tailed)	.419	
	N	30	30

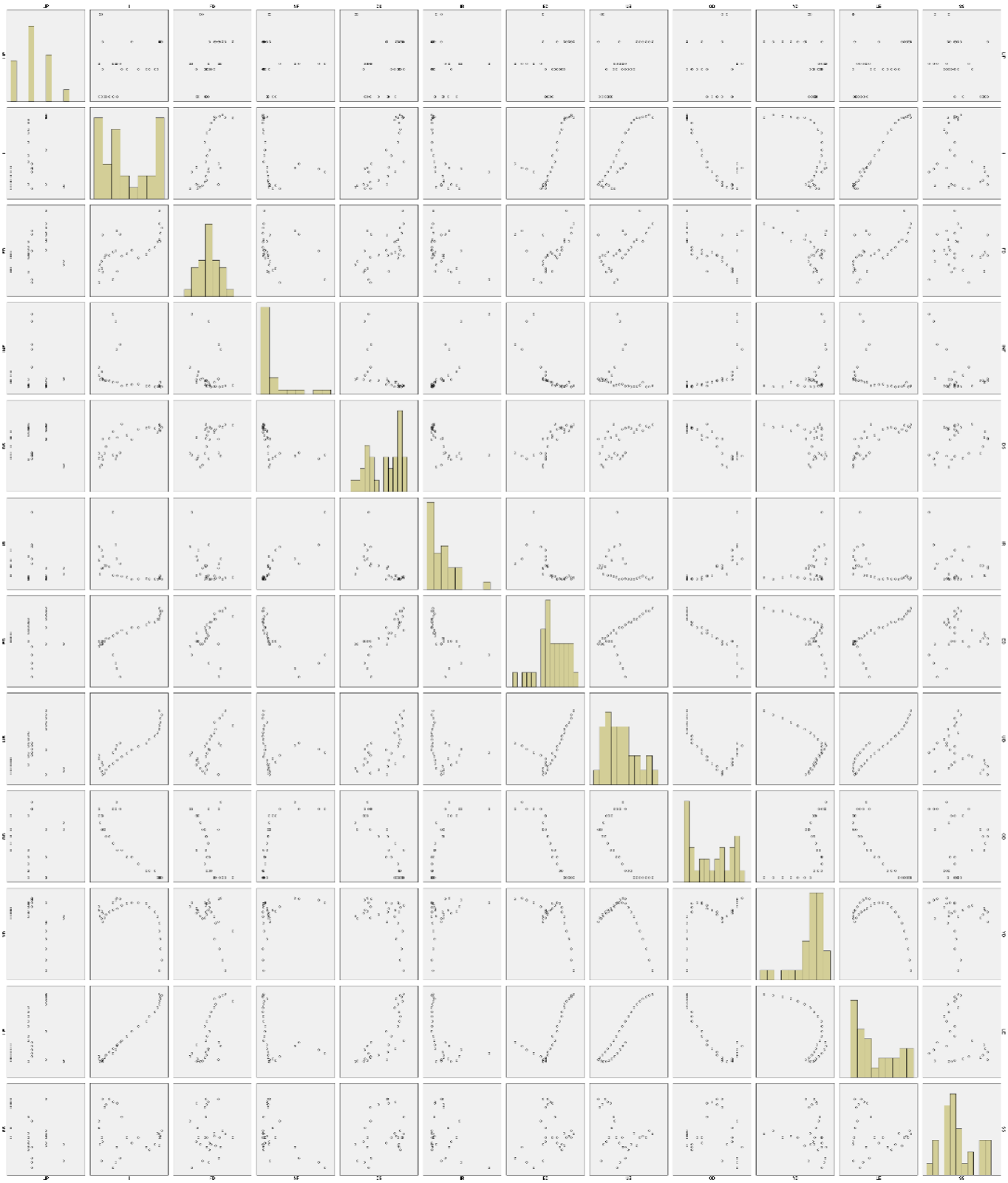
Appendix VI: Test for Homoscedasticity - Spearman's rho

(Source: SPSS Output)

			Standardized Predicted Value	ABS_ZRE_1
Spearman's rho	Standardized Predicted Value	Correlation Coefficient	1.000	-.192
		p-value (2-tailed)	.	.311
		N	30	30
	ABS_ZRE_1	Correlation Coefficient	-.192	1.000
		p-value (2-tailed)	.311	.
		N	30	30

Appendix VIII: Scatterplot for the independent variables

(Source: SPSS Output)



Appendix VIII: Bivariate correlations for independent variables

(Source: SPSS Output)

		I	FD	DS	INF	IR	ED	UB	OD	YD	LE	SS
I	Pearson Correlation	1	.671**	.807**	-.363*	-.562**	.753**	.917**	-.890**	-.537**	.990**	-.245
	Sig. (2-tailed)		.000		.048	.001	.000	.000	.000	.002	.000	.192
	N	30	30	30	30	30	30	30	30	30	30	30
FD	Pearson Correlation	.671**	1	.545**	-.221	-.518**	.354	.657**	-.532**	-.545**	.691**	-.048
	Sig. (2-tailed)	.000		.002	.240	.003	.055	.000	.002	.002	.000	.800
	N	30	30	30	30	30	30	30	30	30	30	30
DS	Pearson Correlation	.807**	.545**	1	-.557**	-.655**	.781**	.631**	-.885**	-.407*	.803**	.236
	Sig. (2-tailed)	.000	.002		.001	.000	.000	.000	.000	.026	.000	.210
	N	30	30	30	30	30	30	30	30	30	30	30
INF	Pearson Correlation	-.363*	-.221	-.557**	1	.85**	-.757**	-.143	.684**	.394*	-.389*	-.465**
	Sig. (2-tailed)	.048	.240	.001		.000	.000	.452	.000	.031	.033	.010
	N	30	30	30	30	30	30	30	30	30	30	30
IR	Pearson Correlation	-.562**	-.518**	-.655**	.85**	1	-.657**	-.345	.763**	.342	-.568**	-.264
	Sig. (2-tailed)	.001	.003	.000	.000		.000	.062	.000	.064	.001	.159
	N	30	30	30	30	30	30	30	30	30	30	30
ED	Pearson Correlation	.753**	.354	.781**	-.757**	-.657**	1	.596**	-.924**	-.664**	.776**	.177
	Sig. (2-tailed)	.000	.055	.000	.000	.000		.001	.000	.000	.000	.351
	N	30	30	30	30	30	30	30	30	30	30	30
UB	Pearson Correlation	.917**	.657**	.631**	-.143	-.345	.596**	1	-.689**	-.616**	.941**	-.355
	Sig. (2-tailed)	.000	.000	.000	.452	.062	.001		.000	.000	.000	.054
	N	30	30	30	30	30	30	30	30	30	30	30
OD	Pearson Correlation	-.890**	-.532**	-.885**	.684**	.763**	-.924**	-.689**	1	.547**	-.885**	-.059
	Sig. (2-tailed)	.000	.002	.000	.000	.000	.000	.000		.002	.000	.755
	N	30	30	30	30	30	30	30	30	30	30	30
YD	Pearson Correlation	-.537**	-.545**	-.407*	.394*	.342	-.664**	-.616**	.547**	1	-.623**	-.125
	Sig. (2-tailed)	.002	.002	.026	.031	.064	.000	.000	.002		.000	.511
	N	30	30	30	30	30	30	30	30	30	30	30
LE	Pearson Correlation	.990**	.691**	.803**	-.389*	-.568**	.776**	.941**	-.885**	-.623**	1	-.193
	Sig. (2-tailed)	.000	.000	.000	.033	.001	.000	.000	.000	.000		.307
	N	30	30	30	30	30	30	30	30	30	30	30
SS	Pearson Correlation	-.245	-.048	.236	-.465**	-.264	.177	-.355	-.059	-.125	-.193	1
	Sig. (2-tailed)	.192	.800	.210	.010	.159	.351	.054	.755	.511	.307	
	N	30	30	30	30	30	30	30	30	30	30	30

**. Correlation is significant at the 0.01 level (2-tailed).