

**UNDERSTANDING LIFE INSURANCE BUYER'S
DECISIONS: A CASE STUDY OF COASTAL
DISTRICTS IN ANDHRA PRADESH**

**A Thesis Submitted to the University of Hyderabad in Partial Fulfilment
of the Requirements for the Award of the Degree of**

**DOCTOR OF PHILOSOPHY
IN
ECONOMICS**

**By
JETTI SWAROOPA
(Enrolment No. 13SEPH04)**



**SCHOOL OF ECONOMICS
UNIVERSITY OF HYDERABAD
HYDERABAD-500046, INDIA
FEBRUARY 2024**

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**Under the Supervision of
Prof. B. Kamaiah and
Prof. R.V.Ramana Murthy**



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DECLARATION

I, Jetti Swaroopa, hereby declare that the research embodied in the present dissertation entitled *“UNDERSTANDING LIFE INSURANCE BUYER’S DECISIONS: A CASE STUDY OF COASTAL DISTRICTS IN ANDHRA PRADESH”* is an original research work carried out by me under the supervision of Prof. B. Kamaiah & Prof. R.V.Ramana Murthy School of Economics, for the award of Doctor of Philosophy from University of Hyderabad. I also declare to the best of my knowledge that no part of this dissertation is earlier submitted for the award of any research degree or diploma in full or partial fulfilment in any other university or institution.

Place: Hyderabad
Date: 05.02.2024


JETTI SWAROOPA
Enrolment No: 13SEPH04



CERTIFICATE

This is to certify that the thesis entitled “**UNDERSTANDING LIFE INSURANCE BUYER’S DECISIONS: A CASE STUDY OF COASTAL DISTRICTS IN ANDHRA PRADESH**” submitted by **Ms. Jetti Swaroopa** bearing registration number **13SEPH04** in partial fulfillment of the requirements for award of **Doctor of Philosophy** in the School of Economics is a bonafide work carried out by her under our supervision and guidance. This thesis is free from plagiarism and has not been submitted previously in part or in full to this or any other university or institution for award of any degree or diploma. Paper related to this thesis has been published

A. PAPER PUBLISHED IN THE FOLLOWING JOURNAL:

1. Swaroopa Jetti (2024), Emerging Trends and Challenges in Life Insurance Industry in India, International Journal of Science and Research (IJSR), ISSN: 2319-7064, SJIF (2022): 7.942, Volume 13 Issue 1, January 2024, pp.1153-1165.

B. PRESENTED IN THE FOLLOWING CONFERENCES:

1. Presented a paper on “Emerging Trends and Challenges in Life Insurance Industry in India”, in the 4th International Conference on Applied Econometrics (ICAE-IV) organised by IBS Hyderabad in collaboration with The Indian Econometric Society on March 20-21, 2014.
2. Participated in workshop on Panel Data Econometrics and its Applications organised by the Gokhale Institute of Politics and Economics (GIPE) and The Indian Econometrics Society (TIES) from 7th to 9th January 2015 at Pune.

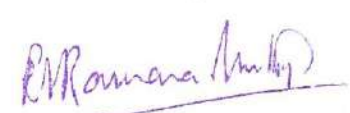
3. Participated in National workshop on Big Data Analytics for Banking, Insurance and Financial Sectors organised by the C R Rao Advanced Institute of Mathematics, Statistics and Computer Science (AIMSCS) from 2nd to 4th November 2015 at Hyderabad.
4. Participated in Three day workshop on An Introduction to Data Analysis Using R organised by School of Economics, University of Hyderabad (UoH) in collaboration with the C.R. Rao Advanced Institute of Mathematics, Statistics and Computer Science (CRRAO AIMSCS), held during the period from 04-March-2016 to 06-March-2016.

Further, the student has passed the following courses towards fulfilment of the coursework requirement for Ph.D./was exempted from doing coursework (recommended by Doctoral Committee) on the basis of the following course passed during her M.Phil. Program and the M.Phil. Degree was awarded:

S. No	Course Code	Name	Credits	Pass/Fail
1.	EC 701	Advanced Economic Theory	4	PASS
2.	EC 702	Social Accounting and Data Base	4	PASS
3.	EC 703	Research Methodology	4	PASS
4.	EC 751	Study Area	4	PASS
5	EC 752	Dissertation	16	PASS


Dean
School of Economics
 DEAN
 SCHOOL OF ECONOMICS
 UNIVERSITY OF HYDERABAD
 Hyderabad-500 046. (INDIA)


Prof. B. Kamaiah
Supervisor
 SUPERVISOR
 SCHOOL OF ECONOMICS
 UNIVERSITY OF HYDERABAD
 Hyderabad-500 046 (INDIA)


Prof. R.V. Ramana Murthy
Co - Supervisor

DEDICATED TO

Sri. D. N. V. VAMSI KRISHNA

Sri. ALLU SHIVA RAMA KRISHNA

&

MY PARENTS

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By

JETTI SWAROOPA

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LIST OF ACRONYMS

LIC: Life Insurance Corporation

IRDAI: Insurance Regulatory Development Authority of India

RBI: Reserve Bank of India

USD: United States Dollar

ULIP: Unit Linked Insurance Plan

GDP: Gross Domestic Product

ARDL: Autoregressive Distributed Lag

lnS : savings per capita

WTO : World Trade Organization

ADF : Augmented Dickey-Fuller

PP : Phillips-Perron

KPSS : Kwiatkowski–Phillips–Schmidt–Shin

ANOVA : Analysis Of Variance

EFA : Exploratory Factor Analysis

CFA : Confirmatory Factor Analysis

OECD : Organization for Economic Cooperation and Development

OLS : Ordinary Least Squares

LPG : Liberalization, Privatization, and Globalization

ULIP : Unit Linked Insurance Plan

Cr : Crore

US : United States of America

CAGR : Compound Annual Growth Rate

HDI : Human Development Index

UNCTAD : United Nations Conference on Trade and Development

DF- GLS : Dickey-Fuller generalized least squares

LM : Lagrange Multiplier

SIC : Schwarz Information Criterion

VIF : Variance Inflation Factor

AR : Auto Regressive

NARDL : Nonlinear Auto Regressive Distributed Lag

CUSUM : Cumulative sum

CUSUM-SQ : Cumulative sum of Squares

Chapter One

Introduction: Context, Motivation and Objectives

1.1.Introduction

Insurance is one of the pillar to any country's risk management system. Everyone has to face risk in our lives. A significant portion of the nation's household savings is derived from the insurance industry, and these savings are subsequently invested in various ways. India's insurance market has undergone a comprehensive transformation throughout the course of more than a century, encompassing its evolution transitioning from a free-enterprise sector to public sector and, ultimately, returning to open market. This journey is characterized by the sector's transition into government control within ten years of independence.

The emergence of insurance was driven by a widespread apprehension of future uncertainty. People aimed to protect their valuable assets from unforeseen risks, and this fundamental requirement manifested through the innovation and improvement of insurance policies. The fundamental principle was to compensate for losses. In our country, the insurance sector underwent nationalization with specific objectives — to extend the insurance network to every corner of the nation, mobilize substantial resources, and contribute to the process of nation-building.

Because they provide essential financial services to both people and the economy as a whole, insurance firms are essential to the financial sector of the economy. Insurance products not only facilitate enduring planning and the re-investment of funds into both private enterprise and public sector projects but also serve as a vehicle for disciplined and contractual savings. Insurance contracts are generally classified as life and non-life. Life, in particular, offers protection to households against the risk of the untimely death of the primary breadwinner."

Despite the significant role insurance plays in risk management, encouraging savings and offering term financing, there have been few systematic attempts to understand the factors driving its demand in India. Various international studies have proposed a range of socioeconomic and institutional components as probable elements of insurance consumption across countries.

Numerous academic inquiries such as Yaari (1965), Campbell (1980), Beenstock, Dickinson, Khajuria (1986), Lewis (1989), Truett and Truett (1990), Browne and Kim (1993), and

Outreville (1990, 1996)”, have consistently highlighted a constructive association between the propensity for life protection uptake and vital factors such as life expectancy, income levels, literacy rates, urbanization, and the degree of development within the banking sector. Though number of insurance companies in India increased significantly, and throughout the nationalization phase, it was difficult for them to reach their full market potential. However, commendable achievements were made in terms of geographical spread, the number of policyholders, and product offerings.

India was anticipated to emerge as a significant participant in the global insurance industry for foreign corporations due to its inclusion services in the WTO General Agreement on Trade in Services, encompassing both banking, insurance sectors.

The wider financial reforms of the 1990s, which included changes to banking, capital markets, currency markets, and other areas, were heavily reliant on changes in the insurance sector. Despite these intentions, political roadblocks hindered the initiation of reforms, slowing down the process of private entry. While nationalization made sense decades ago, the evolving landscape suggests a need for reconsideration.

Information technology, faster communication, heightened consumer awareness, a growing middle class, an aging pensionless demographic, and improved regulatory mechanisms have significantly transformed the landscape. The Malhotra Committee, renowned for its instrumental role, championed the implementation of a stringent regulatory framework, the guarantee of financial stability for all entities involved, and the encouragement of private sector entry, thereby fostering excellence in the construction of the insurance industry. Consequently, the Indian insurance sector was privatized, and foreign equity participation was permitted in 2000.

Like many other Asian nations, India has a lot of room to expand and distribute life insurance because of the country's strong economic growth, rapidly aging population, and inadequate social security and pension systems, which leave the great majority of workers without a secure retirement.

Asian economies, recognized for their swift economic progress, also exhibit elevated rates of saving, contributing to the accumulation of capital and the stimulation of economic growth. A symbiotic link between life insurance businesses and the increase of the per capita GDP is established by the predominance of long-term contractual savings instruments, such as life insurance, which facilitates this phenomena.

1.2. Life Insurance Sector Overview:

"The whole history of the insurance industry has been broken down into three segments for the examination industry: the Pre-Nationalization era (1912–1955), Nationalization and Post-Nationalization (1956–1999), and the post-reformation era (2016)".

This Study primarily focuses on the post-reformation period from 2000 to 2021 to capture emerging trends and changes in the life insurance industry, examining specific indicators such as penetration, density, market share, total premium income, investments, operating expenses, and profits influencing the life insurance industry.

In British India, "there was no specific regulation for the insurance commerce until the Indian Life Assurance Companies Act was enacted in 1928". With the implementation of the Insurance Act of 1938, the insurance industry underwent substantial regulation, leading to significant growth in the business in force during that period. Despite the observed growth trajectory, it was found that life insurance registered moderate growth over time and did not reach a desirable scale due to challenges in coverage and other aspects limiting business expansion.

The life insurance business was nationalized in 1956 due to compelling reasons, including the channeling of more resources to national development programs, increasing insurance market penetration, addressing mismanagement issues against the government, and better protecting the interests of policyholders.

The process of transferring management from the private sector to the government sector through the nationalization of the insurance business was not an easy task. This phase encountered unforeseen teething problems and issues related to compensations, rationalization, categorization of employees at different levels, and other matters.

A trade-off in forming the new organization, Life Insurance Corporation, emerged, established as the only custodian of the life business in India in 1956.

The post-nationalization period of the life insurance business can be assessed by measuring the financial performance and investment portfolio of the LIC of India. The total income of grew exponentially, registering nearly 700 times more from 1957-58 (1.08 billion) to 2001-02

(737.82 billion). A significant part of payments went to surviving policyholders upon the maturity of claims rather than claims by death.

The significant increasing trend in LIC's income generation reflects, to some extent, the popularity of life insurance products, which is attributed to the thriving thrift activities among the public. In 1993, in an attempt to breathe new life into the insurance sector, the government formed a powerful committee led by Mr. R.N. Malhotra. The committee's goal was to support reforms that were intended to make the financial system more competitive and efficient while also meeting the needs of the economy.

The Indian Economic reforms implemented in 1991 made a remarkable impact on the Indian insurance industry. India liberalized the insurance market in two ways: first, it let foreign companies to participate with a majority stake in the insurance sector, and second, it permitted local private-sector companies to offer life insurance. The monopoly LIC lost its power when private companies were allowed to enter the insurance market, and by 2020–21, its stake could only be 64.14%. LIC of India introduced many phenomenal business strategies to compete with private players by offering colorful schemes and products such as an Endowment Policy and money-back policy, contributing 75 percent of the business, and conducting awareness programs extensively. Private insurance companies also offered a plethora of new attractive schemes and products to gain optimal market share by deploying innovative marketing strategies, challenging the supremacy of LIC of India. In India, life and non-life insurance premiums make up 24.7% and 75.2% of total insurance premiums, respectively, compared to 44.5% and 55.5% globally.

The growth of the Indian economy was significantly aided by LIC and private life insurers, according to performance analysis that takes into account parameters like insurance penetration and density, total life insurance premium income, market share, the investment made by the life insurance industry, total expenses, profit or loss, and so on. Two metrics that are frequently used to gauge the rate of expansion of the insurance market in a nation are insurance density, which is defined as the ratio of premium to population (per capita premium), and insurance penetration, which is the percentage of insurance premiums to GDP. Comparing the performance of both density and penetration values with advanced countries is one of the biggest challenges to be addressed in the Indian insurance sector.

As per a comprehensive analysis conducted by Swiss Re Sigma, the global insurance penetration and density for the life segment in 2021 stood at 3.0 percent and USD 382, respectively. India experienced an increase in insurance penetration of from 2.82% in 2019–20 to 3.20% in 2020–21. Worldwide economic swings resulted in a drop in insurance penetration during the period 2009-10 to 2014-15. However, insurance penetration increased again starting in 2015–16. The insurance density in India, recorded at \$59 during the 2020-21 period, remained consistent with the previous year. The insurance density has demonstrated a continuous upward trajectory, surging from USD 9.1 in 2001-02 to USD 55.7 in the fiscal year 2010-11. Following intermittent fluctuations, there has been a sustained upward trend in insurance density since the fiscal year 2016-17.

The insurance sector in India was not exempt from the impact of Liberalization, Privatization, and Globalization. Due to fluctuations in the global economy from 2000-2021, traditionally dominant entities like LIC reflected a decreasing trend in the business graph of the sharing market, being replaced by private and foreign players that entered the insurance sector, registering growth in the market share of the life business. Despite the positive trends of globalization, the life market still faces several issues and challenges.

Even though numerous national and international private players entered the insurance market, LIC remains the dominant player in the insurance sector. The insurance industry is on the upswing in India, and international businesses have shown interest in the enormous market that India provides. There is a lot of room for growth in the insurance industry because more than 50% of financial savings are held by the banking industry. Based on numerous international studies, market in India is projected to expand by more than ten times in the next decade.

1.3. Research Gap

In the context of life insurance in India, the sales process is often initiated by sellers who make efforts to convince passive buyers. Regardless of the accuracy of these perceptions, their impact appears to have insulated the Study of consumer choice, leading to a skewed development of literature. The theory of supply, pricing, and selling of life insurance products has disproportionately evolved compared to the theory of choice for life insurance. Therefore, this Study is designed to demonstrate that life cover is not solely supply-driven; it also depends on demand from the consumer side. In India, the price of life insurance is consistent nationwide, yet life insurance consumption across states varies significantly.

Empirical studies examining the elements influencing life insurance demand are limited in the Indian insurance industry. The existing literature in this field primarily focuses on past data related to insurers. In developed insurance markets, numerous researchers have explored elements impacting demand and buying decisions in the insurance industry. This research gap in understanding determinants and buying decisions in the Indian life insurance industry persists. Additionally, there is a scarcity of primary field research studies specifically conducted in Andhra Pradesh on this aspect, making these studies a crucial source of knowledge in this field of research.

1.4. Motivation for Study

The primary motivation behind this Study is to investigate the factors influencing the demand for life insurance in India. Previous statements on trends in life insurance penetration, density, market share, premiums, etc., highlight that many households in India do not have life insurance. Surveys and literature indicate that economic, demographic, and institutional factors play a crucial role in influencing households to either opt for or abstain from life insurance. These factors also contribute significantly to the substantial disparities in life insurance consumption observed among different states in India.

1.5. Objectives of Study:

The thesis set three major objectives to examine issues revolving around Life Insurance in India.

1. To trace the development of Life Insurance Market in India since 1950
2. To trace factors that influence decision making the purchase of life insurance with particular reference to the coastal districts of Andhra Pradesh.
3. To Identify the demand side influence on life insurance Consumption in India.

The study is based on the data drawn from the secondary sources, as well primary survey. Appropriate methodological tools have been employed to arrive at conclusions.

1.6. Research Methodology:

Objective One:

To analyze the trends and patterns of the life insurance industry in India, this Study utilized simple time series data, growth rates, and performance metrics over a specific period.

Objective Two:

In establishing the causes persuading choices in the obtaining of life insurance in the coastal districts of Andhra Pradesh, existing literature was reviewed. A number of economic, societal, and demographic factors have been proposed as potential influences on the choice to purchase life insurance. The empirical analysis aimed to identify the significant factors influencing life insurance buying decisions in selected districts of Andhra Pradesh. A non-probability sampling method was employed, collecting data from 600 households (400 insured and 200 non-insured) in three coastal districts (Vishakhapatnam, East Godavari, and Srikakulam) of Andhra Pradesh. This purposeful sampling method aimed to deepen the understanding of insurance buyers.

Preliminary analysis involved constructing various economic models using stepwise back regressions to examine the significance and relative importance of each theorized explanatory variable. A final baseline economic model was derived through iterative exercises.

Initially, the theorized model encompassed the aggregate sample of 600 observations from the three districts, tested and estimated using logit regressions. To gain deeper insights into life insurance purchase decisions across the three districts, we constructed separate logit models for each district. Robustness in the models was ensured by deploying clustered-robust standard errors, accounting for heterogeneity across districts and regions. The "Box-Tidwell test and the link test" were used to identify model misspecifications. The "Hosmer-Lemeshow Chi-square test" evaluated each model's goodness of fit.

For the third objective:

The study suggested using the Autoregressive Distributed Lag (ARDL) and Nonlinear ARDL models to discover factors impacting the demand for life insurance in India, taking into account prior research and theoretical background. Pesaran and Shin (1999) introduced the ARDL model, addressing single cointegration, and Pesaran et al. (2001) extended its application. It offers a comparative advantage in producing asymptotically long-run estimates

regardless of variable integration levels. Before applying the ARDL methodology, the Study conducted unit-root tests (ADF, PP, KPSS) to determine each variable's integration level. The long-term relationship was then observed using the ARDL Bound Test, which estimates the model's short- and long-term dynamics.

1.7. Data Sources:

This thesis relies on both primary and secondary data. Information on insurance is gathered from various publications of the IRDA of India, including the Handbook of Indian Insurance Statistics, Annual Reports. Macroeconomic data, such as inflation, savings, and GDP, are sourced from the RBI database on the Indian economy and World Bank.

1.8. Limitation of the Study

- i). The research only included short-term time series (i.e 1991-92 to 2021-22).
- ii). Consequently, the study did not examine how changes in institutional structure, regulations, or political instability can affect the demand for life insurance.
- iii). The study focused on gross premium expenditure, encompassing both new premiums and renewals of old premiums. However, a more detailed examination by separating these components could have provided insights into the factors of purchasing insurance.

1.9. Organization of Thesis:

The remaining thesis encompasses five chapters.

Chapter II explores the literature review of the Indian insurance sector.

Chapter III delves into On the Evolution of Life Insurance Market in India.

Chapter IV on Life Insurance Choice: Proximate Determinants

Chapter V On Life Insurance Demand in India: Key Influences

Finally, Chapter VI summarizes significant findings and offers concluding remarks.

Chapter Two

Review of Literature

2.1 Introduction:

With the evolution of insurance sector over the period of time, numerous studies were conducted to assess the factors influencing the decision-making process for purchase of life insurance products. This section reviews significant of empirical studies that examined the demographic and socioeconomic factors that influence an individual's insurance buying decisions.

2.2 Theoretical literature review

Conventional economic theory operates under the premise that people are rational actors. Behavioral economics, on the other hand, asserts that human behavior is not well captured by the rational model of utility maximization (Thaler & Benartzi, 2002; Kahnemann & Tversky, 1979; Simon, 1982). The observed deviation from logical behavior is explained by prevalent cognitive biases that are ingrained in human psychology as well as cognitive capacity limitations. According to Madrian (2014), there are three ways in which these biases operate: (i) nonstandard preferences, (ii) restricted self-control, and (iii) imperfect optimization.

Bounded rationality, as characterized by Simon (1957) "as imperfect optimization, suggests that human intelligence is constrained in its ability to process information". This limitation can arise from factors such as a shortage of time, information, mental capacity, or distractions. Bounded self-control posits that even when individuals are aware of what they should do, emotional or psychological barriers may prevent their behavioral intentions from translating into actual conduct.

Nonstandard preferences indicate that an individual's choices are influenced by their values, beliefs, and societal conventions. These preferences are subject to change over time, adapting to the individual's circumstances at each moment and the context in which decisions are made.

When attempting to comprehend how decisions pertaining to personal financial management could deviate from reason, these three criteria are very pertinent. Since financial concepts are thought to be difficult to understand, the first factor—"bounded rationality"—is significant. Even within the demographic of college degree holders, there exists a deficiency in financial literacy (Lusardi & Mitchell, 2009; Hung et al., 2009; Huston, 2010). Insurance, being a sophisticated instrument for risk management, requires a significant level of financial acumen and comprehension for customers to make well-informed decisions. A large portion of information on insurance comes from recommendations by insurance professionals or word-of-mouth.

The other element, "bounded self-control," include significant effects on financial understanding. With respect of shaping of finances, procrastination is rampant, self-control is weak, and the general population's prudence is poor (Thaler & Shiffrin, 1981; Akerlof, 1991; Charupat & Deaves, 2004; Lusardi, 2008). Many members of the populace view insurance as an unavoidable investment / saving for future security rather immediate benefit.

Irrational behavior in decision making process of consumers is due to influence of non-standard preferences along diverse value systems. Personal values and views might vary among people. In order to conform to social standards and expectations, they could act in a way that isn't optimal for them personally. Though an individual's utility might not be maximized, the welfare of the collective would be maximized.

Insurance purchasing patterns in India may deviate from those in other countries, primarily influenced by various factors, such as low levels of financial literacy in the region. In 2000, the insurance industry's monopolistic nature was opened to the private sector. The collectivistic culture and the sudden discovery of affluence among young Indian adults. In addition, it is critical to determine whether specific choices are indicative of the well-publicized mis-selling of insurance in India and abroad. The study's main objective is this.

2.3 Empirical literature review:

An attempt has been made in this chapter to present an overview of various Empirical studies.

2.3.1 Review of works based on Primary Surveys:

The empirical literature spanning five decades was thoroughly and in-depth surveyed by Zietz(2003). They examined and studied varied factors including age, income, Education, marital status, size of family, and occupation influencing the demand for life insurance. While an increase in social security options and higher life insurance premiums showed a negative correlation with the demand for life insurance, higher income, Education, and larger family size were consistently associated with a positive correlation. In addition, Zietz noted that certain research revealed confusing and conflicting findings regarding age and family size—two factors that influence the need for life insurance.

Preeti and Rajesh's (2010) attempt to pinpoint the influence of the factors on the nation's life insurance ownership. According to logistic regression research Insurance-covered households are often wealthier, better educated, and more upbeat, than households without insurance for their future stability. Apart from asset ownership, two other important factors that influence life insurance participation are the occupation and educational attainment of the household's primary wage earner. Moreover, larger levels of engagement are shown among households with more optimism over the sufficiency of their future income and savings. Regarding these influencing elements, no distinction between rural and urban areas has been seen.

Ulbinaite *et al.* (2013) studied Lithuanian insurance customer behavior. The study looks at how consumers make decisions and behave when buying insurance. Three hundred thirty-six respondents, including both current and future customers of insurance services completed the survey. Factor analysis, multiple regression, mean, and path analysis are the instruments used by the researcher. Ultimately, the study findings indicate that sociodemographic data demonstrate that decisions about the purchase of insurance services usually involve a thorough examination and assessment of the terms and options available for the purchase of the insurance.

Liebenberg et al. (2012) employed data covering the years 1983–1989 from the Survey of Consumer Finances (S.C.F.). The demand for life insurance and life events were found to be significantly correlated. Specifically, they discovered that getting married, having

a kid, beginning a new career, and income are all positively correlated with demand for life insurance.

Giri & Chatterjee (2018). Understanding the socioeconomic and demographic factors influencing changes in Indian households' life insurance use is the aim of this study. Short panel data from the Indian Household Development Survey covers 34,855 households from 2004 to 2005 and 2011 to 2012. According to logistic regression models, the biggest influences on insurance acquisition and discontinuation are income and socioeconomic status, which are both positive. Insurance coverage rose in rural households but not in urban ones as a result of financial inclusion, as measured by bank relationships. By focusing on variations in insurance coverage over time rather than static demand, the study adds to the body of existing literature.

Annamalah (2013) explains married couples' life insurance purchasing decision behavior in Malaysia. The author analyzed the impact of socioeconomic and demographic factors' influence on the demand for life insurance. This paper undertook a primary survey to determine the purchasing behavior of married couples.

The study spanned from August 2012 to February 2013., and they used the logit qualitative approach. The total sample size used for the study is 525 respondents. The variables used in this logit model are as follows: dependent - Purchasing Life Insurance policies and independent variables are age, ethnicity, Education, income of the head of the family, children, occupation, risk, and working wife. The results found from the study are that the household head income and education variables are statistically significant; this study suggested that profiling the life insurance customer will be helpful in the demand determination process.

Hecht et al. (2010). A study to relate how tax incentives impact customer behavior in the life insurance industry during Germany's income tax reforms in the year 2005. A comparative assessment of the sociodemographic, economic, and psychological features of households, as revealed by the German SAVE study, reveals that two distinct consumer groups purchase endowment life insurance prior to and subsequent to the tax reform. They discover that responses to the altered tax environment are heavily influenced by schooling.

Bediako's (2014) study analyzed the Ghana life insurance market demand from women. The study used Sunyani Township area women and collected 100 samples. They used the

ANOVA method to analyze the data. The results show us that socioeconomic and demographic factors.

Influence on the insurance purchasing decision and awareness among women about life product is low.

Dash (2018) The study was carried out in rural Odisha, With a sample of more than 400 people who had life insurance policies. The impact of several customer demographics, including age, gender, marital status, occupation, Education, family size, and annual income, on their purchasing behaviors has been covered in this study. It comprised these variables as well as the selling company, residence area, and annual premium amount (price).

They conducted One-way ANOVA test and correlation analysis to evaluate notable differences and correlations within the divers' categories. To determine significance, other methods include factors analysis (E.F.A and C.F.A) and linear multiple regression. The purpose of this study is to assist life insurance in comprehending the different aspects that influence potential customer's decisions to purchase a policy.

2.3.2 Review of Macro Studies:

Browne and Kim (1993). The research, which covered 45 nations over two different time periods (1980 and 1987), found that while social security spending and income are important factors in determining the need for insurance, inflation and demand for insurance are inversely related. Incorporating religion as a dummy variable indicates a negative inclination of Muslim countries toward life insurance. However, factors such as dependency ratio, Education, and life expectancy did not exhibit significance.

Mitra & Ghosh (2010) during the study period from the year 1991 to 2008, authors used three models to study determinants of demand for life insurance in India. The study included Life insurance penetration, density, and new policies as a dependent variable for three models and real personnel disposable income, financial development index, wholesale price index, interest rate, life expectancy at birth, Education Index, Urbanization rate as independent variables for three models. The study employed the Engel- Granger Cointegration methodology. The results are as follows: real personnel disposable income and financial development index were India's most significant determinants of demand for life insurance. They found Education had a negative association, but it is statistically

significant, and inflation had a positive and statistically significant association. Opportunity cost variable interest rate had a negative and significant association.

Sen and Madheswaran's (2013) study explores the factors influencing the demand for life insurance in twelve Asian economies, encompassing nations from the South Asian Association for Regional Cooperation, the Association of Southeast Asian Nations, and collaborative regions. They employed the panel data technique. The findings indicate that a number of important factors influence the decision to purchase life insurance, including income, financial stability, inflation, real interest rates, and the juvenile dependence ratio. Growth may be promoted by better laws and foreign ownership. Urbanization and the literacy rate are among the few factors found to have zero effect. The study adds to our understanding of the expanding insurance market in the area and draws attention to the short comings of studies that use macro data.

Beck and Webb (2002) analysed factors of life Insurance consumption across countries . They made use of two data sets: 1) a panel data set covering 23 countries from 1960 to 1996, and 2) a cross-sectional data set including developed and developing nations around 63 countries from 1980 to 1996. In order to gauge various facets of life insurance consumption, they chose density, penetration, and life insurance in force as indicators. The authors divided explanatory variables into demographic, economic, institutional, and regional time dummy variables. The results indicate that life insurance penetration and density increase with income level. But there is no independent effect of real per capita income on life insurance in force to gross domestic product. All three indicators of life insurance consumption are strongly correlated with education. Banking sector developed countries experience higher levels of life insurance consumption. Inflation and education underline in explaining life insurance consumption across countries from the panel analysis from 1960-96.

Lee, Chiu, and Chang (2013). Utilizing the data from the International Country Risk Guide (ICRG), a novel panel smooth transition regression model, and an unbalanced panel sample covering 39 countries between 1984 and 2009 studied. Financial, political, and economic risks are income elasticity of life insurance demand.

Explanatory factors in the analysis include life insurance, urbanization level (URBANPOP), inflation (I.N.F.), real interest rate (R.I.R.), life expectancy (LIFEEXP), dependency ratio (D.E.P.), and education level (E.D.U.). With the exception of D.E.P. and LIFEEXP, which have no bearing on the demand for non-life insurance. Though it bearing same characteristics as life insurance. Results suggested that a reduction in economic risk lowers the sensitivity of insurance demand concerning income change. In countries characterized by high income, common-law origin, and permission for insurance activities by banks, the elasticity decreases; however, in their respective counterparts, the elasticity increases when political risk is lower. A reduction in financial risk is associated with an augmented income elasticity in demand for life insurance, contrasting with a decrease in elasticity observed in the case of nonlife insurance demand. The study underscores the pivotal influence of a country's risk environment on shaping insurance demand, a facet often neglected in current research literature.

Ward and Zurbruegg(2002) investigated the impact of law, and politics, on life insurance consumption in Asia between 1987 and 1998. The study did a comparative analysis between Asia, and the more developed market of the OECD. Economic, social, political, and legal rights have all been employed as explanatory variables, with density serving as a dependent variable. Two distinct methodologies viz 1. pooled cross-section O.L.S. regression and 2. panel regression have been used to thoroughly explain the relationship between these explanatory factors and density. The first set of empirical analysis included social and economic variables that explain the negative signs between the young depended ratio and life insurance consumption. There is a significant relation for income in Asia, but insurance consumption becomes less sensitive to income growth for OECD samples. Inflation remains uncertain; financial development shows positive signs for developed nations and less effect in Asian nations. The second set of results show legal and political variables bearing beneficial role of the legal environment, and no evidence is shown to support the impact of the political environment.

Hawariyuni and Salleh's (2012) For the period from 1988 to 2010 the paper studies the relationship between economic and socioeconomic variables and their relation to the demand for life insurance in Malaysia. The author devised two models: one is life takaful (Insurance), and the other model is General takaful (Insurance). The variable used in the first model, family life takaful, is the dependent variable, and G.D.P. and Education are the dependent variables. The Second Model consists of General takaful as the dependent

variable and G.D.P. and Education as the dependent variables. They have applied the ARDL model as a methodology. When it comes to family takaful (life insurance), there is a positive correlation in the short term between income and Education, but not in the long term. The second model, general takaful results, shows no short- or long-term relationship between the G.D.P. and Education with general takaful.

Sadhak (2006) used Pearson's correlation coefficient to find that there is a significant association between the demand for life insurance and certain macroeconomic indicators. The demand for life insurance was influenced positively with an increase in gross domestic product through per capita disposable income and savings. Nonetheless, savings statistics related to Indian life insurance and macroeconomic variables often show a significant association and interaction among macroeconomic variables and life insurance demand.

Mathew and Sivaraman's (2017) article investigates the macroeconomic factors that impact the demand for life insurance in India. Prolonged time series data from 1980–1981 to 2013–2014 are examined using suitable econometric techniques like stationarity, Cointegration, and causality. The empirical study reveals that whilst income and interest rates have a negative impact on life insurance consumption, the expansion of the financial sector and inflation are favorable predictors of life insurance demand. The research discovers evidence of a negligible relationship among purchasing life insurance in India and social security provisions.

Sehar Munir, Azra Khan and Ahsan Jamal (2013) studied the impact of macroeconomic and demographic variables such as savings, income, price of insurance, financial development, urbanization, age, dependency ratio, death rate and birth rate on demand for life insurance. They used OLS model to study the secondary data obtained from 1973 to 2010 in Pakistan. Findings of their study indicate that all the variables considered except price of insurance, have a direct positive influence on demand for life insurance.

2.4 Concluding Observations: The primary and secondary data-based research provides us with a research gap to investigate further. Restricting our focus on India, there are comparatively fewer recent micro-level studies on the demand for life insurance. According to Kakar and Shukla (2010), a static cross-sectional study conducted on Indian households between 2004 and 2005 people who earn more money, have more Education, and work for a salary are more likely to participate in life insurance. The difference between rural and

urban areas does not seem to matter. The dynamic study by Giri and Chatterjee (2021) of thirty thousand Indian households from 2004–05 to 2011–12, on the other hand, finds that income is a significant determinant, particularly for urban households. In addition to income, estimates indicate that the likelihood of purchasing life insurance is directly proportional with family size and inversely proportional with age and marriage.

In the Secondary data context, the current study finds Uncertainty in single country macro-level studies is unwarranted and demands decisiveness in order to enable effective policy decisions, which is in contrast to unit-level studies where results are inevitably sample-specific and contextual. This review seeks to comprehend certain methodological errors in prior available research with the goal of identifying the key factors influencing both the absolute and per capita demand for life insurance in India. Specifically, it deviates from previous research in terms of representation, accounts for collinearity bias, and utilizes statistical tests with more power to determine and predict the time-series characteristics of the macroeconomic variables more accurately. More significantly, it contributes to the existing literature by taking into consideration the asymmetric relationship that exists between ability to pay and the demand for life insurance. By doing this, it verifies the theorized duality of life insurance as an instrument of saving and as a consumer product through empirical evidence.

Chapter - Three

On the Evolution of Life Insurance Market in India

3.0. Introduction

In this Chapter, an effort made to trace the development of life Insurance market in India. The analysis has been done by dividing the whole period into pre-nationalization (1912-1955); nationalization (1956-1999); and post-reformation period (2000-2021). To capture aggregate market trends in life insurance, indicators such as penetration, density, market share, total premium expenditure, etc., have been employed.

3.1. Life Insurance Market before Nationalization Period (1912-1955)

During the colonial era in British India, the insurance industry operated without explicit regulatory frameworks until the inception of the Indian Life Assurance Companies Act in 1912. Subsequently, the enactment of the Indian Insurance Act in 1928 sought to confer authority upon the Government to systematically collect statistical data pertaining to entities engaged in both life and non-life insurance sectors, encompassing provident societies. In a concerted effort to safeguard the interests of the insured Public, prior legislations were amalgamated and modified. This culminated in the comprehensive provisions of the Insurance Act of 1938, which established a framework for meticulous and effective control over the entirety of the insurance business, encompassing both life and non-life sectors.

Many Indian enterprises entered the insurance business during the nationalistic fervor of the Civil Disobedience Movement (1929) and the Non-Cooperation Movement (1919). The inaugural Indian insurance yearbook noted a rise from 44 companies in 1914 to 195 by 1940. During this epoch, the aggregate scale of the industry witnessed a substantial escalation from Rs 0.22 billion to Rs 3.01 billion, encompassing 16,28,381 policies. Concurrently, the life fund demonstrated a progressive augmentation, ascending from Rs 0.06 billion to Rs 0.6 billion.

The year 1938 bears considerable importance in the insurance landscape, characterized by the implementation of a rigorous regulatory framework through the Insurance Act of 1938. Subsequent to its enactment, the life insurance industry has grown steadily throughout the years, with the exception of a temporary pause in 1947–1948 caused by India's division. The life insurance enterprise has been widely diversified throughout the country, during which there were 209 insurers with Rs.712.76 Cr. business force apart from

increasing the number of policies to 30,16,000 with the growth of life fund to 299.7 Cr. then in 1955 even though the investment of life fund was mainly confined to government securities and incorporate securities.

Table 3.1: Life Insurance Business in the Pre-Nationalization Period

Year	1914	1915	1920	1925	1930	1935	1940	1945	1950	1955
No.of insurers	49	-	-	-	-	-	-	215	-	245
No. of Indians	36	40	43	49	110	215	179	198	185	149
New business										
No.of policies	-	-	0.28	0.43	1.45	2.39	2.06	5.99	4.98	8.31
Sum Assured (Rs crore)	3.20	2.25	5.16	8.15	27.5	43.5	36.11	136.3	139.5	260.8
Total business										
No.of polices (Lakhs)	-	-	-	-	5.64	10.95	15.53	23.92	32.80	47.82
Sum assured (Rs Crores)	-	-	-	-	124	235	286	557	780	1220
Life fund(Rs Crores)	6.36	6.77	8.47	12.57	20.53	35.19	62.41	107.4	181.5	299.7

Source: Indian Insurance Year Book, Agarwala (1961:21-73), Bhawe (1970:340-51)

As seen in the above Table 3.1., the total number of Indian insurers stands at 36 as against the total 49 insurers that existed in 1914. The number of Indian companies had reached 198 by the year 1945, but astonishingly, this number has come down to 149 as against the total insurers of 245 in the year 1955, which is said to be mainly due to mismanagement of funds.

There were just Rs 3.2 Crores in the new business sector in 1914; by 1935, that figure had risen to Rs 43.5 Crores, and by 1955, it had reached Rs 260.8 Crores. Within a span of forty years, the quantum of premiums has increased by 81.5 times. The number of new policies grew from 28,000 to 8,31,000 during the period from 1920 to 1955.

The life fund business, initially valued at Rs 6.36 crores in 1914, underwent a significant expansion, surging to Rs 299.7 crores by 1955. This trajectory signifies a noteworthy acceleration in the overall growth of the life fund. Similarly, the total number of policies in 1930 was 5,64,000, and they were at 47,82,000 by 1955. The total sum assured in 1930 was Rs 124 Crores, which grew to Rs. 1220 Crores by 1955.

As discerned from the growth trajectory, it is evident that life insurance experienced moderate expansion over a specific time frame. Furthermore, the extent of insurance coverage did not attain a desirable scale. This deficiency is attributed to the numerous challenges faced by the insurance industry, particularly concerning coverage and other pertinent factors impeding the expansion of the business.

3.2. Nationalization Period of Life Insurance Market (1956)

There were 154 Indian life insurance companies when the industry was nationalized in 1956. Seventy-five provident societies and sixteen international insurance firms were also present. The decision taken by union government to nationalize the insurance industry was driven by compelling reasons. First, it aimed to allocate more resources to national development programs, ensuring a direct and centralized approach to financial support for key sectors contributing to economic growth and social welfare. Second, the Government sought to enhance insurance market penetration by nationalizing the industry. A broader initiative to promote financial inclusion and make insurance services more widely accessible to the population was a strategic step. This strategic maneuver constituted a pivotal component of a comprehensive initiative aimed at fostering financial inclusion and enhancing the widespread accessibility of insurance services to the population. Additionally, pivotal to this decision were concerns regarding the unacceptable mismanagement observed within private insurance companies, a matter deemed incompatible with the Government's standards and principles.

Nationalization provided an avenue for the Government to intervene, take control, and implement reforms to address any perceived shortcomings in financial stability and management practices. Collectively, these reasons compelled the Government to opt for the nationalization of the insurance sector. The overarching goal was to better protect the interests of policyholders by ensuring a more transparent, accountable, and public-oriented approach to the management of the insurance industry.

Life insurance nationalization is a significant step toward the socialist society. Its goal is to benefit both the people and the government. With the enactment of the "Life Insurance (Emergency Provisions) Ordinance, 1956" on January 19, 1956, India's Prime Minister, Shri Jawaharlal Nehru, then took the first step toward nationalizing life insurance. As a result, 245 Indian and international insurers as well as provident organizations that operated in India had their life insurance business taken over by the federal government first via the application of this legislation.

3.2.1. Transition from Private to Public Sector:

As was known, obviously, it was not an easy undertaking to shift management from the commercial sector to the government sector. Combining them into a single organization in order to expand the life insurance industry's nationwide network and sustainably secure new business. Many unanticipated teething problems and challenges with paying remuneration, rationalization, classifying staff at different levels, and other issues surfaced during this time.

3.2.2. Formation and Structure of the LIC:

On September 1, 1956, the Life Insurance Corporation Act conferred official authority upon LIC, designating it as the exclusive custodian of the life insurance sector in India. On September 1, India provided LIC with a paid-up capital of Rs. 50 million. There was a tradeoff in the formation of the new organization, whether the Government should closely monitor it or should be an autonomous organization, which became a question for debate then. The decision was made to form a corporation with 5 zonal offices, 33 divisional offices, and 212 branches.

In order to guarantee a proficient oversight of the operational and performance aspects of the LIC, the government instituted a robust mechanism designed to ensure accountability of this entity to the nation. As part of this initiative, LIC is required to undergo audits conducted by qualified auditors appointed with the Central Government's consent. The stipulation includes the necessity for actuarial investigations and the submission of valuation reports to the Central Government at least once every two years. Moreover, it is incumbent upon the Central Government to submit the annual report, audited financial statements of the corporation, actuarial investigation valuation reports, and auditors' reports to both houses of Parliament on an annual basis. This framework serves to uphold transparency, accountability,

and facilitates a methodical examination of the financial and operational endeavors of LIC, consonant with the overarching national interests.

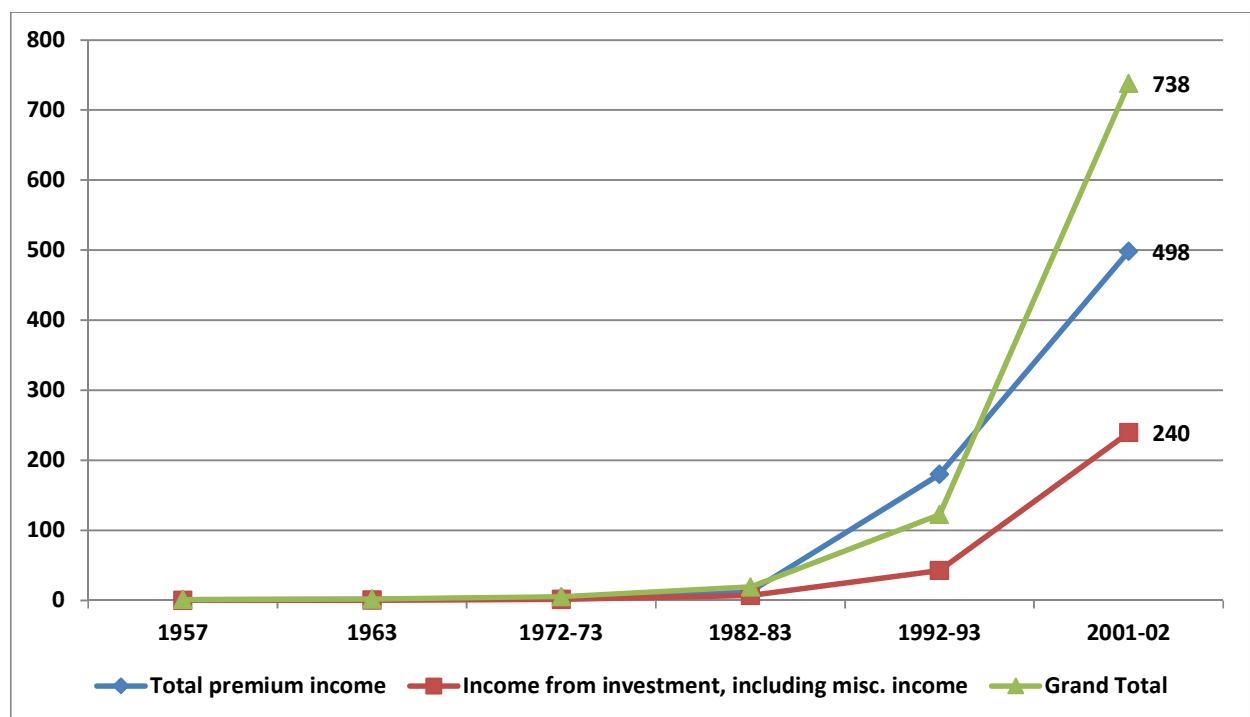
3.3. Post Nationalization Period of Life Insurance Market (1956-1999)

The post-nationalization era of life insurance can be assessed by scrutinizing the financial performance and portfolio investment of the LIC.

3.3.1. Life Insurance Corporation of India's Financial Performance:

The total income of Life Insurance Corporation grew from Rupees 1.1 billion in the year 1957-58 to Rupees 737.8 billion in the year 2001-02 by registering an exponential growth, otherwise called nearly 700 times more when compared to the income generated in 1957-58. The largest part of payments went to the survival policyholders (maturity claims) rather than the claims by death.

Figure:3.1. Total Income of LIC 1957 – 2001 (Rs. in billions)



Source: Malhotra Committee Report, 1994

Figure: 3.2.Expenditure of LIC 1957 -2001

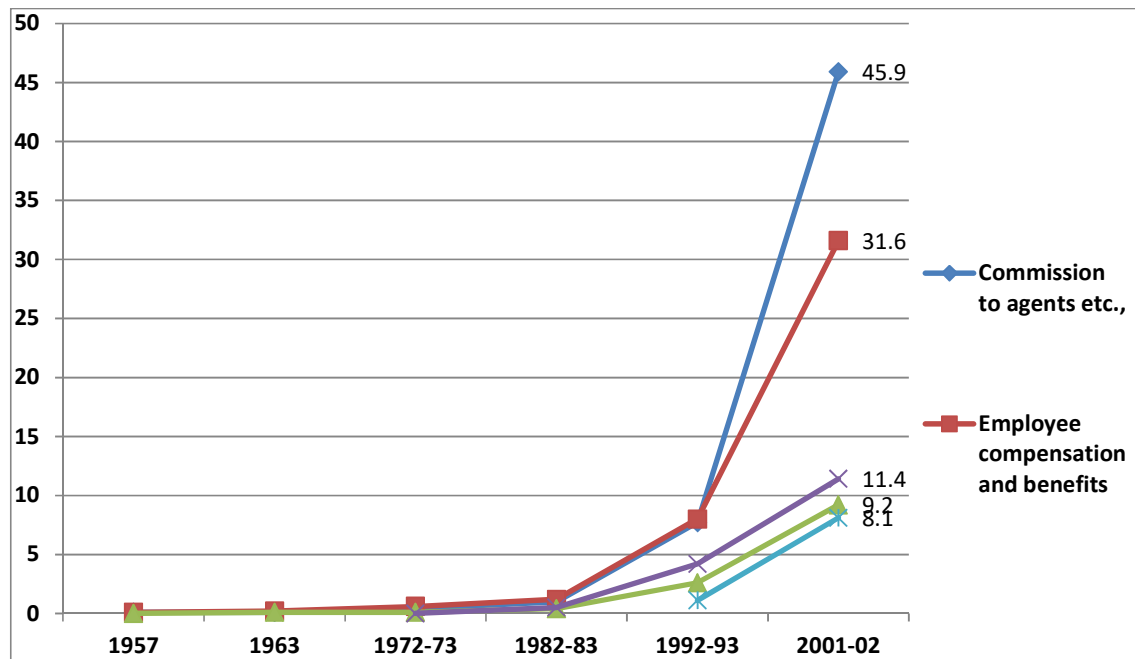


Figure:3.3. Payment to Policy Holders by LIC

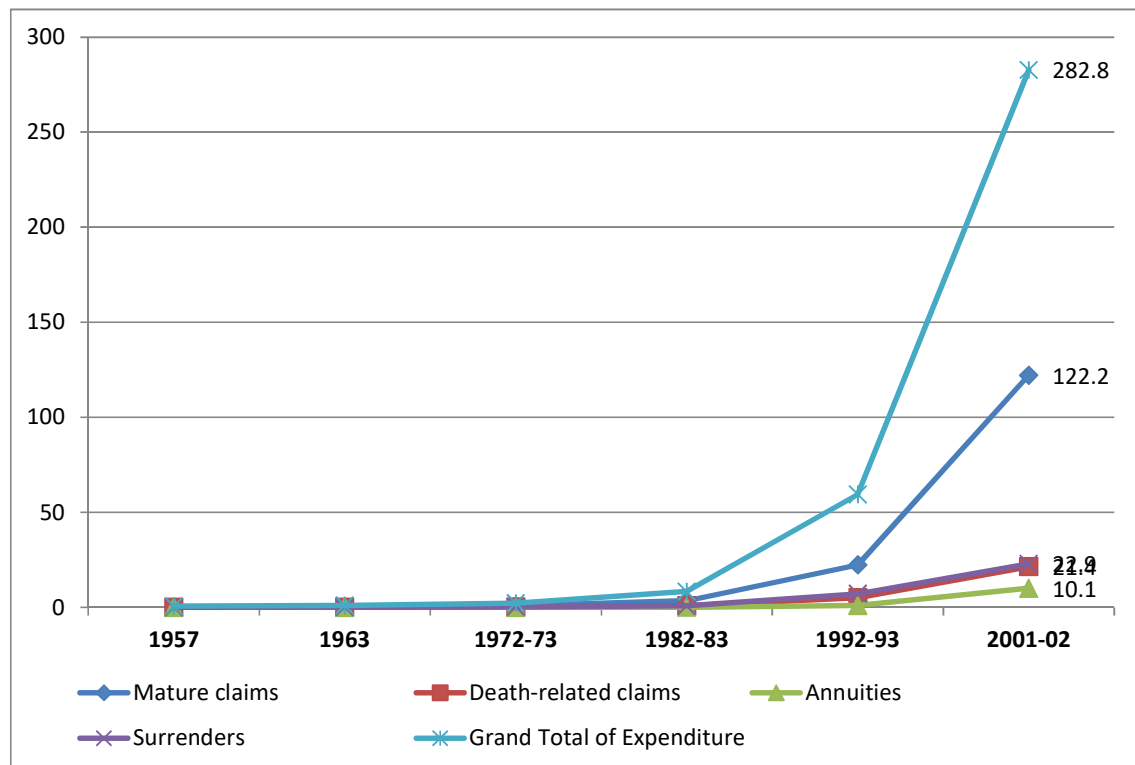
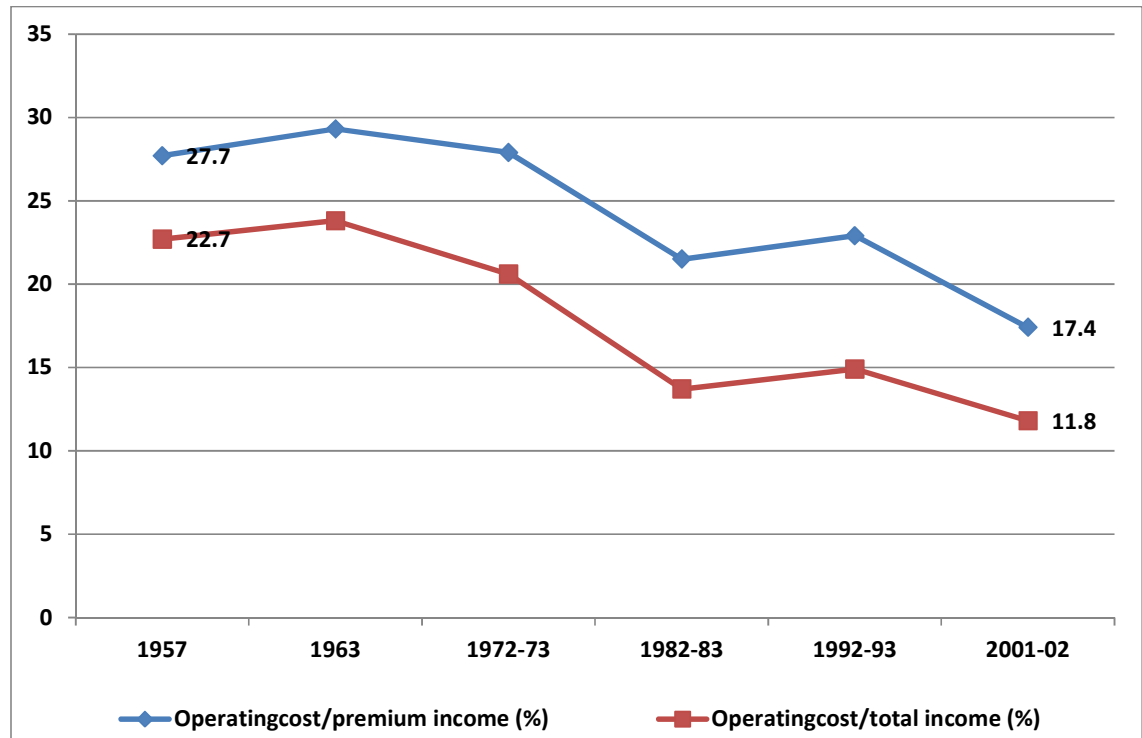


Figure:3.4. Operating Performance of LIC



The increasing trend in income generation reflects, to a certain extent, that life insurance products gained momentum significantly over a period of time because of their popularity, which can be attributed to the thriving thrift activity among the Public. Another interesting change Observed in the life insurance industry is that, over the past 20 years, there has been a drop in both operational expenses and premium revenue., after sustaining its higher rate from 1956-57 to 1982-83, as a result of the rise in the sale of group life insurance plans, which are more affordable than individual life insurance, along with the organization's growing capacity for fund management in the years following nationalization.

3.3.2. Investment Portfolio of the LIC:

As seen in the trajectory of an investment portfolio, a paradigm shift has been noticed in investing the funds of LIC during the period from 1980 to 2000. The investment percentage of loans to "State and Central government and their corporations and boards" reduced from 42% to 18%. In contrast, its share in federal, state, and municipal government securities has grown from 55% to 80%.

Table 3.2: Share of Asset Portfolio of the LIC 1980-2000 (in Percentage)

Year	Central Government Loans	Government bonds	Special Government Securities	Unapproved schemes	Overseas investment	Total
1980-81	41.7	55.0	1.6	1.1	0.6	100
1990-91	33.6	59.2	5.6	1.1	0.5	100
1991-92	4.9	85.5	6.9	1.9	0.8	100
1992-93	34.1	60.1	4.2	1.1	0.5	100
1993-94	31.4	63.4	3.6	1.1	0.5	100
1994-95	28.7	66.4	3.3	1.1	0.6	100
1995-96	26.5	69.0	2.9	1.2	0.5	100
1996-97	24.8	71.2	2.6	0.9	0.5	100
1997-98	23.1	73.3	2.4	0.8	0.4	100
1998-99	21.7	75.4	1.8	0.8	0.3	100
1999-00	19.8	77.9	1.4	0.6	0.3	100
2000-01	18.3	79.8	1.1	0.5	0.3	100

Source: LIC annual reports

As a result of structural changes in the investment of funds, LIC has grown to be one of India's biggest holders of government bonds. Additionally, the LIC has increased its equity participation more aggressively, through both pre-selected investors and stock exchange secondary market acquisitions.

3.4. Post-Liberalization Era of Life Insurance Market

The state's monopoly following the nationalization of the life insurance industry in 1956 and the general insurance industry in 1972 has led to complacency throughout the workforce, from the cutting edge to the apex level. This monopoly has additionally led to the adoption of antiquated technologies, inefficiencies in providing customer services, and a neglect in addressing potential market segments. In order to revitalize the insurance industry through reforms, the Government set up a high-powered committee headed by Mr R. N. Malhotra to complement the reforms in the Indian Financial sector. These reforms were aimed at creating

a more efficient and competitive financial system that is best suited to the requirements of the economy.

3.4.1. Impact of Liberation, Privatization, and Globalization (LPG) on Life Insurance Industry:

The Indian economic reforms, which were implemented in 1991, had a remarkable impact on the Indian insurance industry. India opened up the insurance market on two fronts. First, the life insurance market was opened to domestic private-sector enterprises. Second, international businesses were given the opportunity to take part, albeit with a shareholding cap that initially went up to 26% and then increased to 49% and finally 74%. The LIC of India introduced many phenomenal business strategies by way of offering colorful schemes and products¹ To compete with the private players in this domain, apart from taking up awareness programs in a big way to penetrating the newer areas without allowing a single stone unturned in capturing the market, even though the private insurance companies are offering a plethora of new attractive schemes and products to get an optimal share in the insurance market by throwing a potential challenge by deploying innovative marketing strategies to overcome the supremacy of the LIC in India.

Following the liberalization of the insurance sector, an evaluation of the performance of both the Public and Private sectors has been conducted, considering specific parameters such as insurance penetration and density, total life insurance premium income, market share, investments made by the life insurance industry, overall expenses, and financial outcomes (profits or losses), among others. It is noted that both LIC and private life insurers have made substantial contributions to the economic growth of India. The parameter-wise trend analysis is illustrated below.

3.4.2. Penetration & Density of Life Insurance in India:

Insurance penetration and density are the best indicators to measure the level of development of the insurance sector in a particular demographic unit. The proportion of GDP that goes toward insurance premiums is known as the insurance penetration. Insurance density is worked out as a ratio of premium to population, which is nothing but per capita premium. Further, the ratio of insurance density to the insurance penetration is simply the per capita GDP. It stands as a prime economic indicator signifying a nation's progress, with per

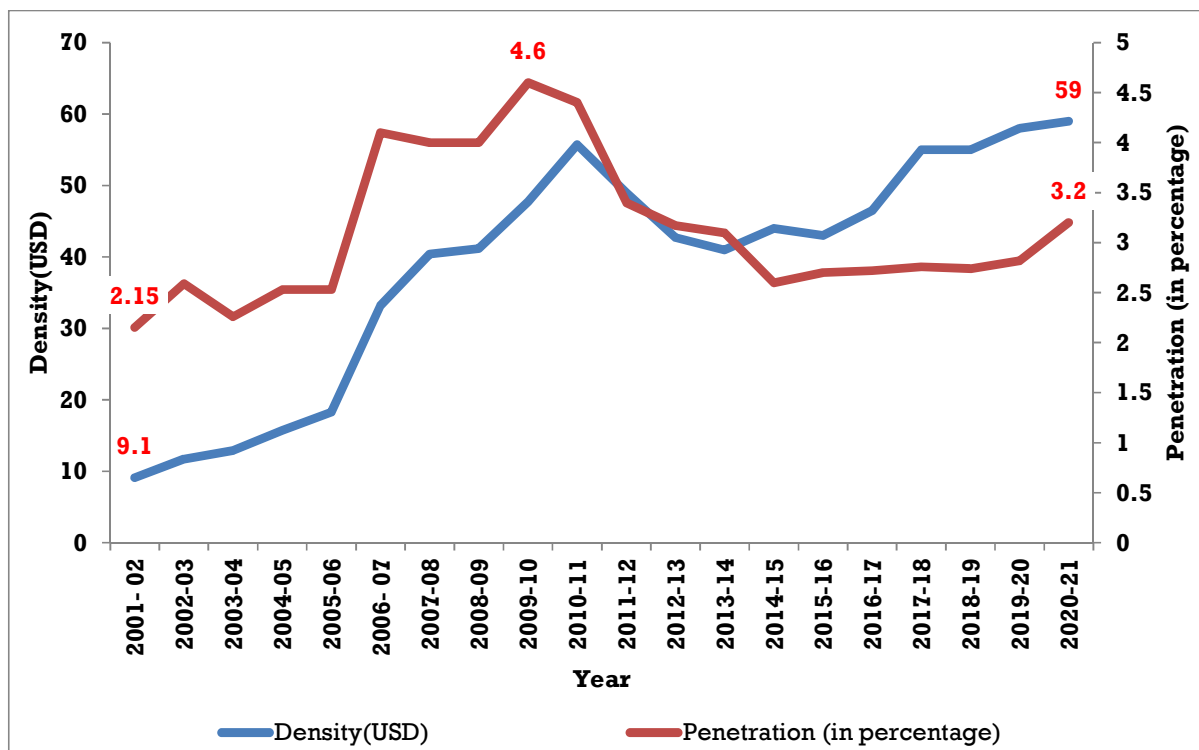
capita income serving as a representation of the individual economic activity within the economy and reflecting the standard of living of its populace.

Table - 3.3: Penetration & Density of Life Insurance in India from 2001-02 to 2020-21

Year	Density(USD)	Penetration (in percentage)
2001- 02	9.1	2.15
2002-03	11.7	2.59
2003-04	12.9	2.26
2004-05	15.7	2.53
2005-06	18.3	2.53
2006- 07	33.2	4.10
2007-08	40.4	4.00
2008-09	41.2	4.00
2009-10	47.7	4.60
2010-11	55.7	4.40
2011-12	49.0	3.40
2012-13	42.7	3.17
2013-14	41.0	3.10
2014-15	44.0	2.60
2015-16	43.0	2.70
2016-17	46.5	2.72
2017-18	55.0	2.76
2018-19	55.0	2.74
2019-20	58.0	2.82
2020-21	59.0	3.20

Source: Handbook on Indian Insurance Statistics

Figure - 3.5: Life Insurance Penetration and Density in India – 2001-02 to 2020-21



The numerical data presented in the above Table 3.3 and Fig 3.5 reveals that the insurance density was at US \$9.1 in 2001-02, which gradually increased to US \$ 59.0 in 2020-21, whereas the percentage of insurance penetration was registered at 2.15% in 2001-2002 and it has gone up to 4.6% which is the peak performance in its growth trajectory till 2009-10 and later started declining trend and settled at 3.2% in 2020-21. When the performance of both density and penetration values compared with the advanced countries, these values are very low, and this is one of the biggest challenges to be addressed in the Indian insurance sector by flagging it as priority one to compete with the matured economies in the world.

3.4.3. Market Share of Life Insurance Companies

The impact of LPG also affected the insurance industry, posing significant challenges to formerly dominant companies like LIC. This was seen in the market share business graph on this front. The state sector's 35.86% loss of LIC throughout the study period (from 99.98% to 64.14%) was clearly offset by the entry of private and international firms into the insurance market, whose market share increased from 0.02% to 35.86%. Due to global economic

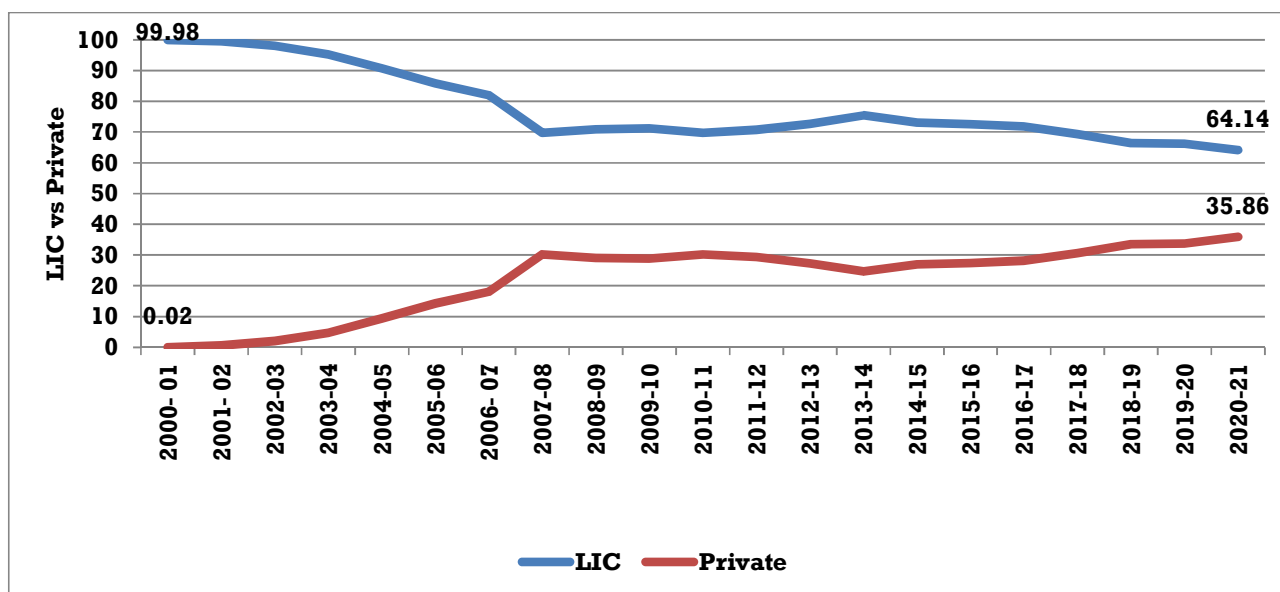
fluctuations, the insurance sector faced volatility to sustain its consistency of market share within a span of two decades.

Table-3.4: Market Share of Life Insurance 2000 to 2021 (In %)

Year	Types of Business		
	LIC	Private	Total
2000- 01	99.98	0.02	100
2001- 02	99.46	0.54	100
2002-03	97.99	2.01	100
2003-04	95.32	4.68	100
2004-05	90.67	9.33	100
2005-06	85.75	14.25	100
2006- 07	81.92	18.08	100
2007-08	69.78	30.22	100
2008-09	70.92	29.08	100
2009-10	71.18	28.81	100
2010-11	69.77	30.23	100
2011-12	70.68	29.32	100
2012-13	72.70	27.30	100
2013-14	75.39	24.61	100
2014-15	73.05	26.95	100
2015-16	72.61	27.39	100
2016-17	71.81	28.19	100
2017-18	69.36	30.64	100
2018-19	66.42	33.58	100
2019-20	66.22	33.78	100
2020-21	64.14	35.86	100

Source: Various Annual Reports of IRDA from 2000-01 to 2020-21

Figure-3.6: Market Share of Life Insurance 2000 to 2021 (In %)



3.4.4. Total Life Insurance Premium Income Sector Wise:

The public sector's (LIC) business turnover was Rs.34,890.02 Crores in 2000–01; by 2020–21, it had increased by 1056 times to Rs.4,03,286.55 Crores. In the meantime, the private sector had a 1702-fold gain, going from Rs 6.45 crores in the 2000–01 fiscal year to Rs 2,25,444.48 crores in the 2020–21 economic year.

**Table- 3.5: Total Life Insurance Premium Income Sector-Wise
(2000-2001 to 2020-01)**

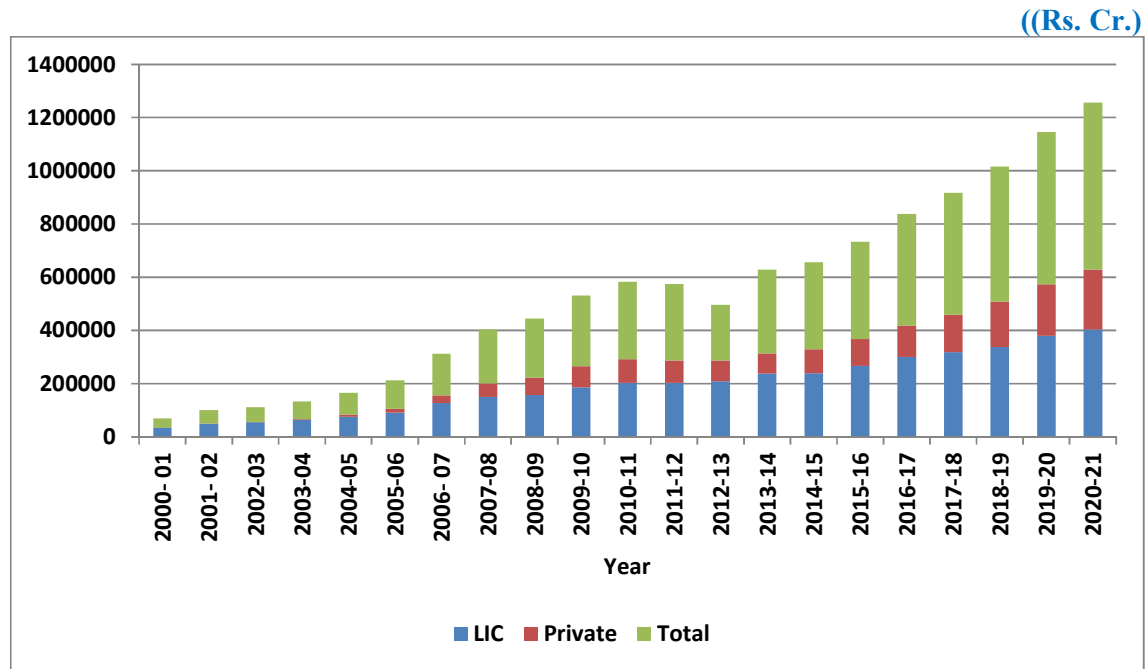
(Rs. Cr.)

Year	Type of Business		
	LIC	Private	Total
2000- 01	34890.02	6.45	34898.47
2001- 02	49821.91	272.55	50094.46
2002-03	54628.49	1119.06	55747.55
2003-04	63533.43	3120.33	66653.75
2004-05	75127.29	7727.51	82854.80
2005-06	90792.22	15083.54	105875.76
2006- 07	127822.84	28242.48	156065.32
2007-08	149789.99	51561.42	201351.41
2008-09	157288.04	64497.43	221785.47

2009-10	186077.31	79369.94	265447.25
2010-11	203473.40	88165.24	291638.64
2011-12	202889.28	84182.83	287072.11
2012-13	208803.58	78398.91	208803.58
2013-14	2,36,942.30	77,359.36	3,14,301.66
2014-15	2,39,667.65	88,434.36	3,28,102.01
2015-16	2,66,444.21	1,00,499.03	3,66,943.23
2016-17	3,00,487.36	1,17,989.25	4,18,476.61
2017-18	3,18,223.21	1,40,586.23	4,58,809.44
2018-19	3,37,505.07	1,70,626.96	5,08,132.03
2019-20	3,79,389.60	1,93,520.59	5,72,910.19
2020-21	4,03,286.55	2,25,444.48	6,28,731.04

Source: Various Annual Reports of IRDA from 2000-01 to 2020-21.

Figure - 3.7: Total Life Insurance Premium Income Sector-Wise (2000-01-2020-21)



Then it gradually increased to Rs 84,182.83 Crores in 2011-12. Between 2000-01 and 2011-12, it increased 13,051 times because of the low base in the initial year. Overall, all premium growth in the private sector is only moderate because many private companies are operating, and as there is only one company in the public sector (LIC), they have good business. The

private sector has a lot of potential, so it can increase its penetration and expand its premium base

The data provides on the total life insurance premium income in India from 2000-01 to 2020-21, categorized by sector. According to the Table, India's life insurance sector brought in a total of Rs. 34,898.02 crores in premium income in 2000–01; this figure rose to Rs. 2,42,181.15 crores in 2010–11 and Rs. 4,58,212.49 crores in 2019–20. This indicates a significant growth in the life insurance industry in India over the past two decades.

The Table 3.6 and Figure 3.3 also shows that the public sector dominated the life insurance industry in India during the early 2000s, with LIC accounting for the majority of the premium income. However, the private sector has gained significant market share over the years, with its premium income increasing from Rs. 6 cr in 2000-01 to Rs. 2,25,444.48 Crores in 2020-21. This indicates that the private sector has been successful in increasing its penetration and expanding its premium base in the Indian market. Another interesting insight from the Table is that the growth rate of the life insurance industry in India has been volatile over the years. For instance, the growth rate was 8.22 times between 2000-01 and 2011-12, but it decreased to 1.89 times between 2011-12 and 2019-20. This indicates that the life insurance industry in India is subject to various external factors, such as economic conditions, regulatory changes, and market competition, which can impact its growth trajectory.

3.4.5. Share of Each Fund in Total Assets under Management:

The share of assets under the management of the life insurance industry is as follows: It is mainly divided between life fund, pension and group fund, and ULIP Fund.

Table 3.6: Share of Fund in Total Assets under Management (AUM)

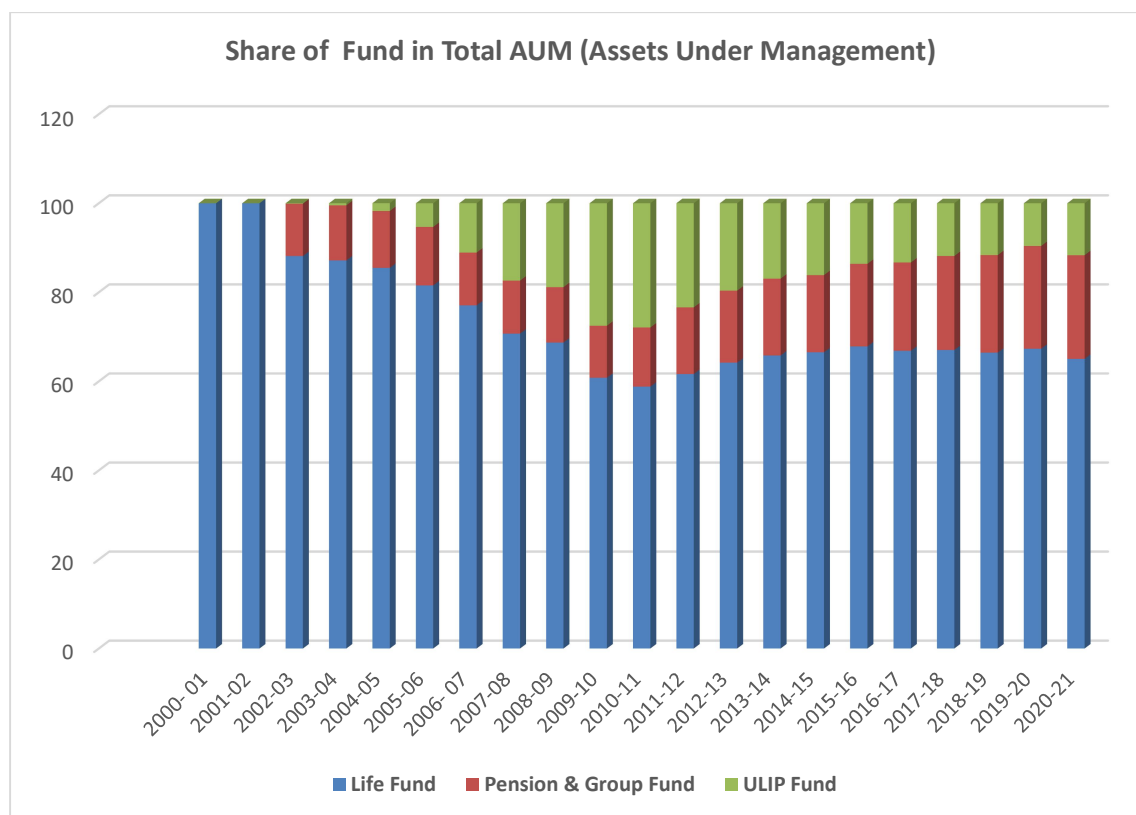
(in %)

Year	Life Fund	Pension and Group Fund	ULIP Fund	Total
2000- 01	100.00	0.00	0.00	100.00
2001-02	100.00	0.00	0.00	100.00

2002-03	88.14	11.76	0.10	100.00
2003-04	87.15	12.37	0.48	100.00
2004-05	85.48	12.77	1.76	100.00
2005-06	81.53	13.15	5.31	100.00
2006- 07	77.06	11.85	11.10	100.00
2007-08	70.71	11.91	17.37	100.00
2008-09	68.71	12.44	18.85	100.00
2009-10	60.79	11.69	27.52	100.00
2010-11	58.81	13.28	27.91	100.00
2011-12	61.64	14.97	23.40	100.00
2012-13	64.19	16.18	19.63	100.00
2013-14	65.81	17.25	16.94	100.00
2014-15	66.53	17.33	16.14	100.00
2015-16	67.84	18.55	13.61	100.00
2016-17	66.85	19.84	13.31	100.00
2017-18	67.03	21.12	11.85	100.00
2018-19	66.44	21.91	11.65	100.00
2019-20	67.32	23.08	9.60	100.00
2020-21	65.05	23.28	11.67	100.00

Source: Handbook on Indian Insurance Statistics, 2020-21

Figure 3.8: Share of Fund in Total Assets under Management (AUM) (in %)



The life fund had the highest share of assets under management in 2000-01, accounting for 100% of the total assets. However, this share gradually decreased over the years, and by 2020-21, it accounted for only 65.054% of the total assets. This suggests that the development of new schemes and legislative changes over time have made the life fund less significant. Hence, Pension group funds and ULIP funds have gained more prominence.

The Pension & Group fund had no share of assets under management in 2000-01, but its share increased to 23.28% by 2020-21. This indicates that the pension and group fund has become an important during the years, a portion of the Indian life insurance market. The increase in the share of this fund can be attributed to the growing demand for pension and group insurance products in the Indian market.

The ULIP Fund has experienced a faster growth rate compared to the Group and Pension Funds. The ULIP fund did not have any assets under administration in 2000–01, but in 2010–11, it held the largest percentage in the preceding 20 years, at 27.91%. However, due to market volatility, the share of ULIPs progressively declined year by year, reaching 9.60% in 2019–20 and standing at 11.67% at the end of the year 2020-21. This indicates that the

ULIP fund has become an important part of the life insurance industry in India over the years. Unit Linked insurance plans (ULIPs) are becoming more and more popular in the Indian market, which is why this fund's share has increased. ULIPs, or investment-cum-insurance products, give policyholders the freedom to allocate their funds among debt, equity, and hybrid funds based on their investment objectives and risk tolerance.

All things considered, this shows that the investment sector has been expanding gradually as more people have begun to invest in a variety of funds in order to achieve their financial objectives.

3.4.6. Fresh Policies Issued by Companies of Life Insurance:

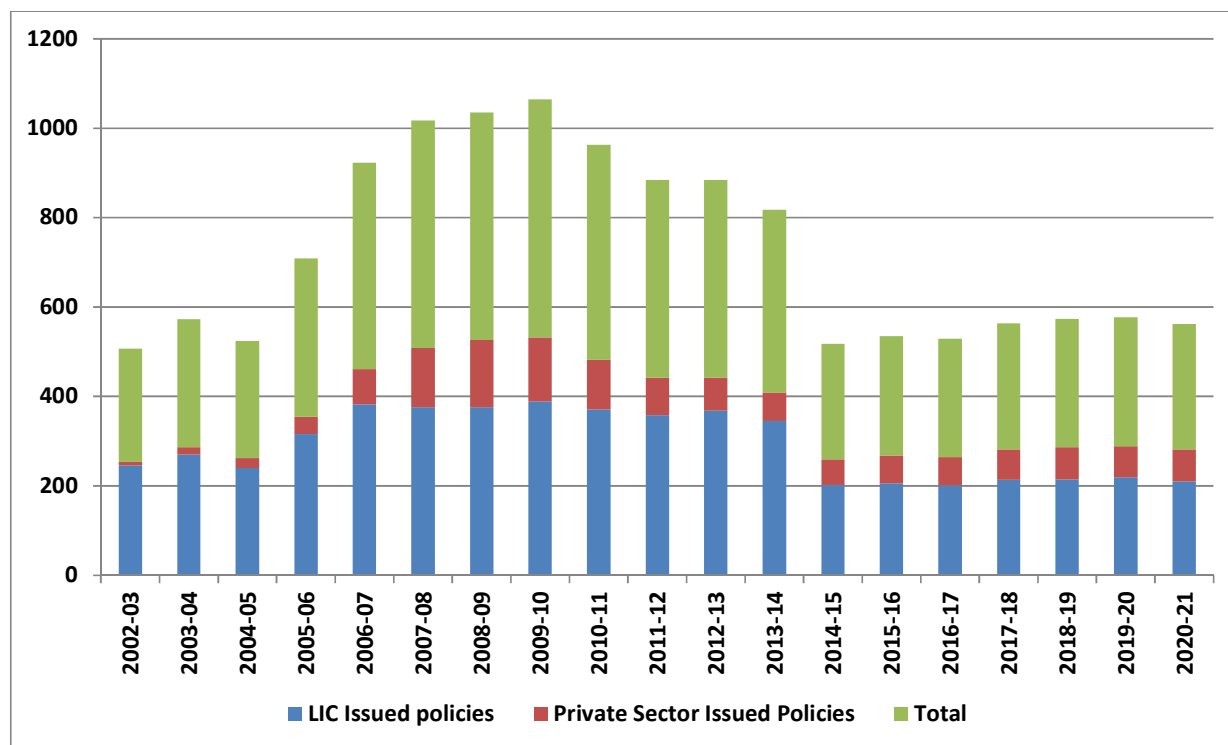
Table 3.7: Fresh Policies Issued by Companies of Life Insurance (Rs. in Cr.)

Year	Type of Business		
	LIC Issued policies	Private Sector-Issued Policies	Total
2002-03	245.45	8.25	253.70
2003-04	269.68(9.87)	16.58(101.05)	286.26(12.83)
2004-05	239.78(-11.09)	22.33(34.62)	262.11(- 8.44)
2005-06	315.90(31.75)	38.71(73.37)	354.61(35.29)
2006-07	382.29(21.01)	79.22(104.64)	461.51(30.14)
2007-08	376.12(-1.61)	132.61(67.40)	508.73(10.23)
2008-09	376.12(-4.52)	150.11(13.19)	509.24(0.10)
2009-10	388.63(8.21)	143.62(-4.32)	532.25(4.52)
2010-11	370.38(-4.70)	111.14(-22.61)	481.52 (-9.53)
2011-12	357. 51(-3.47)	84.42(-24.04)	441.93(-8.22)
2012-13	367.82 (2.88)	74.05 (-12.28)	441.87 (-0.01)
2013-14	345.12 (-6.17)	63.6 (-14.11)	408.72 (-7.50)
2014-15	201.71 (-41.55)	57.37 (-9.79)	259.08 (-36.31)
2015-16	205.47 (1.86)	61.93(7.92)	267.38 (3.20)
2016-17	201.32 (-2.02)	63.24(2.13)	264.56(-1.05)
2017-18	213.38 (5.98)	68.59(8.47)	281.97(6.58)
2018-19	214.04 (0.31)	72.44 (5.61)	286.48 (1.70)
2019-20	218.96 (2.30)	69.5 (-4.05)	288.47 (0.69)
2020-21	209.75 (-4.21)	71.52 (2.90)	281.27 (-2.49)

Source: Various Annual Reports of IRDA from 2000-01 to 2011-12.

Note: The percentage increase over the prior year is shown by the figure in brackets.

Figure 3.9: Fresh Policies Issued by Companies of Life Insurance (in Crores)



LIC Policies:

LIC issued policies increased steadily from 2002-03 to 2005-06, with a significant spike in 2005-06. There was a fluctuating pattern from 2006-07 to 2014-15, with a sharp decline in 2014-15. The trend stabilized from 2015-16 onwards but did not reach the peak levels observed in the mid-2000s. Comparing LIC's policies to the prior year, there was both positive and negative growth, which suggests variations in market demand and business success. Notably, there were drastic declines in 2014-15, indicating a potential issue faced by LIC that year. LIC issued policies increased steadily from 2002-03 to 2005-06, with a significant spike in 2005-06. There was a fluctuating pattern from 2006-07 to 2014-15, with a sharp decline in 2014-15. The trend stabilized from 2015-16 onwards but did not reach the peak levels observed in the mid-2000s.

Private Sector Issued Policies:

Over time, the policies of the private sector increased steadily, exhibiting a positive growth trend. Even in years when LIC experienced declines, the private sector's policies demonstrated consistent growth despite being significantly lower than LIC's.

Total Policies (LIC and Private Sector):

The total number of policies issued (LIC plus private sector) exhibited a pattern resembling that of LIC. The sharp decline of LIC in 2014–15 coincided with a hit to the overall policies. Nonetheless, the total policies bounced back in the following years, indicating the market's overall resilience.

Market Dynamics:

The information points to a complicated interaction between consumer preferences, market forces, and possibly internal LIC factors that influence policy issuances. Over time, the private sector grew in popularity, maybe due to increased competition and market liberalization.

Challenges and Opportunities:

The sharp decline in 2014-15 should be investigated to identify the root causes. It might indicate a challenge faced by LIC that year, such as changes in regulations or market preferences. Opportunities lie in stabilizing LIC's policy issuances and leveraging the consistent growth in the private sector. It can be important to recognize and take advantage of market demands.

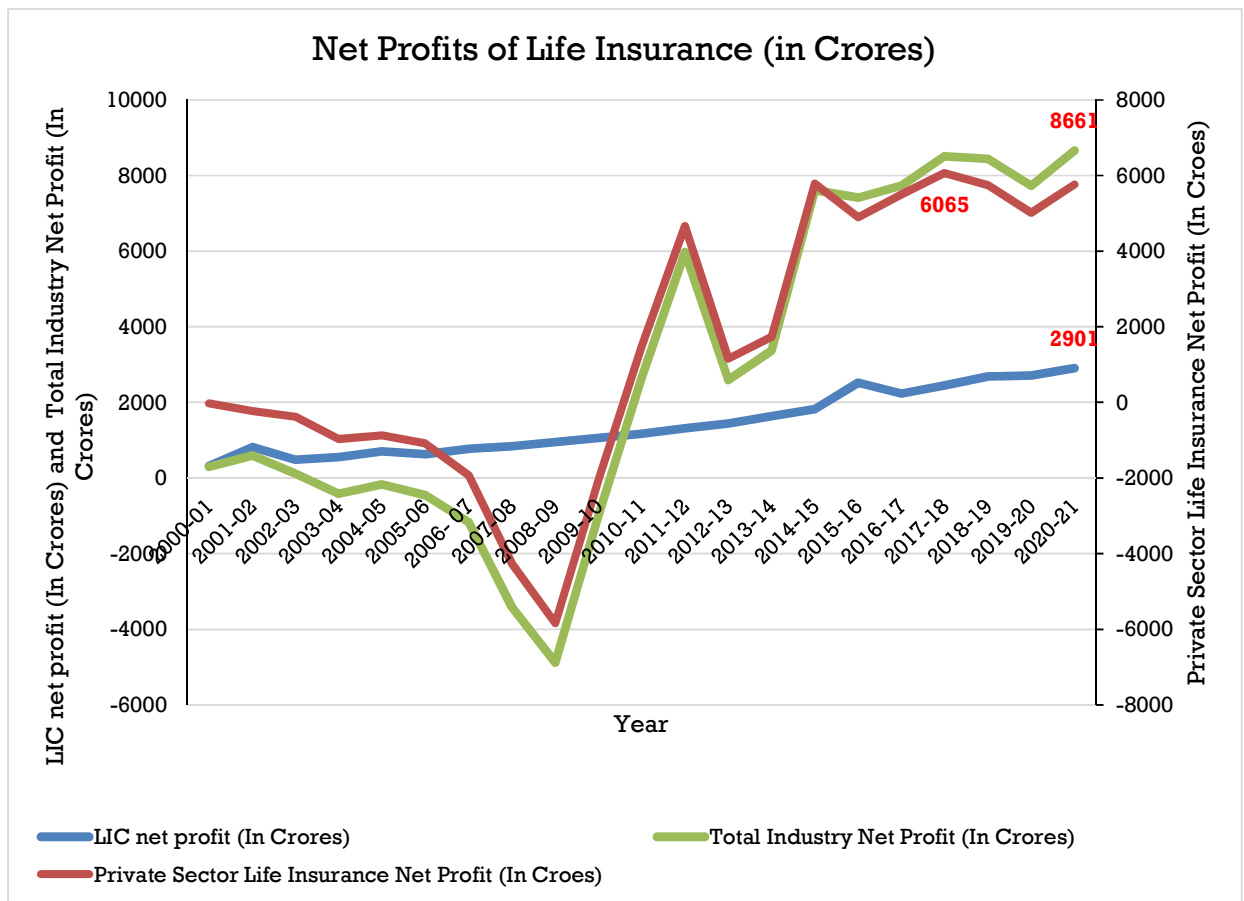
3.4.7. Net Profits of Life Insurance:**Table 3.8: Net Profits of Life Insurance (in Crores)**

Year	LIC net profit (In Cr)	Private Sector Life Insurance Net Profit (In Cr)	Total Industry Net Profit (In Crores)
2000-01	316	(25)	291
2001-02	822	(228)	594
2002-03	488	(377)	111
2003-04	552	(967)	(415)
2004-05	708	(873)	(165)
2005-06	631	(1083)	(452)
2006- 07	774	(1933)	(1159)
2007-08	845	(4257)	(3412)
2008-09	957	(5836)	(4879)
2009-10	1,061	(2050)	(989)
2010-11	1172	1485	2657
2011-12	1,313	4661	5974
2012-13	1436	1156	2592
2013-14	1634	1740	3374

Year	LIC net profit (In Cr)	Private Sector Life Insurance Net Profit (In Cr)	Total Industry Net Profit (In Crores)
2014-15	1824	5787	7611
2015-16	2518	4897	7415
2016-17	2232	5496	7728
2017-18	2446	6065	8511
2018-19	2689	5747	8436
2019-20	2713	5015	7728
2020-21	2901	5760	8661

Source: Collected from the yearly reports of Insurance Regulatory and Development Authority of India (IRDAI) 2000-01 to 2020-21. (Figures in brackets indicate losses)

Figure 3.10: Net Profits of Life Insurance (in Crores)



Net profit of life insurance is the true financial performance indicator for any company. The overall trend in the total industry net profit shows a significant increase from negative to positive figures in subsequent years, indicating overall growth in the life insurance sector.

Over the years, LIC has consistently outperformed private insurance companies in terms of profits.

Up until 2009–2010, private insurance companies faced difficulties; during that time, their profits were negative. This could result from several things, including internal management problems, economic conditions, and market competition.

There is a significant gap between LIC's profits and those of private sector companies. LIC's profits were consistently higher, indicating a stronger market presence, customer trust, or potentially more effective management strategies.

From about 2010 to 2011, the net earnings of the private sector enterprises increased positively, pointing to a time of stability and prosperity for the industry as a whole.

A period of market stability has been indicated by the relatively stable profits of both private insurance companies and LIC in the most recent years (from 2014-15).

3.5. Life Insurance Industry in India - Current Scenario

The demand for life insurance in India continues grow at significant rate considering current low penetration rate of 4% and low density of 70 USD, the insurance sector has a huge potential to increase its market capitalization. Numbers apart the COVID pandemic have significantly transformed insurance sector and catalyzed the growth rate in the past two years. This can have a long sustained positive influence on business growth, insurance penetration, product and process innovation and most importantly customer experience.

India's insurance industry is a 6th largest industry, as on 2021 her total insurance premium volume is about 127\$ million. When it comes life insurance in particular India rank 10th in the world and life insurance industry alone is 100.4\$ billion industries as reported for the year 2021.

The life insurance sector had a notable rise in premium income in the fiscal year 2020–21, with revenues of 6,28,731 crore as opposed to 5,72,910 crore in the previous financial year, signifying a jump of 9.74 percent. The insurers in the private sector saw a strong upswing, with their premium revenue increasing by 16.50 percent. In contrast, the LIC saw a remarkable gain of 6.29 percent. The renewal premiums accounted for 55.67 percent of the total premium for the 2020–21 fiscal year, which is higher than the 54.75 percent reported in the 2019–20 fiscal year. This indicates the life insurers' continued financial health. The remaining 44.33 percent was supplied by new business premiums (45.25 percent in 2019–20). The increase in renewal premiums from 2020 to 20 was 11.60 percent (compared to 7.00 percent in 2019–20). Compared to a growth of 20.59 percent in 2019–20, the first-year premium has increased by 7.5 percent.

A closer look of the first-year premium bifurcation shows that the life insurers' single premium revenue increased positively by 26.07 percent in 2020–21 (10.71 percent in 2019–20). Because single premium policies account for 37.32 percent of LIC's total premium income, they play a significant role. Furthermore, for private insurance businesses, the percentage of single premium revenue to total premium income is 21.07 percent in 2020–21 (18.90 percent in 2019–20).

The premium income showed a positive growth rate of 9.74 percent in the 2020–21 fiscal year. The private insurance industry grew favorably by 16.50 percent. 12.41 percent in 2019–20 and 6.3 percent in 2020–21 were reported by the LIC.

The premium income for unit-linked products (ULIPs) increased from 83,050 crore in 2019–20 to 91,007 crore in 2020–21, a 9.58 percent rise. The premium revenue in the fiscal year 2020–21 showed a positive growth rate of 9.74%, which is a slight decrease from the rise of 12.75 percent in the previous fiscal year of 2019–20. Conversely, private insurers had positive growth of 16.50 percent.

3.6. Conclusion:

This Chapter traces the evolution of the life insurance industry in India since Nationalization. Despite the privatization of the sector, the liberalization of foreign investments, the introduction of innovative products, and an expansion in providers, the market's growth has not been extraordinary. Notably, life insurance penetration, delineating the economy's proportion of expenditure on life insurance premiums in relation to the aggregate demand expenditure, has been in a declining trajectory since the mid-2000s, following a previously consistent ascent. Despite the privatization of the sector, the liberalization of foreign investments, the introduction of innovative products, and an expansion in providers, the market's growth has not been extraordinary. Notably, life insurance penetration, delineating the economy's proportion of expenditure on life insurance premiums in relation to the aggregate demand expenditure, has been in a declining trajectory since the mid-2000s, following a previously consistent ascent. At present, penetration stands at 3.2% of the GDP.

In summary, bottlenecks arising from demand in India's life insurance sector deserve attention. To halt the downturn and establish a thriving market environment, it is imperative to understand what influences the demand for life insurance in the economy. The rest of the study focuses on achieving this.

Chapter 4

On Life Insurance Choice: Proximate Determinants

4.1 Introduction

Every man is subject to the uncertainty of death, and his household to the risk of potential loss of income from his death. The decision to purchase life insurance involves a rational man's evaluation of the future financial needs and consumption requirements of the family in the event of his untimely demise. He buys a life insurance policy to hedge the risk of leaving his children and dependents deprived of the current standard of living. (Yaari, 1965; Hakanson, 1969; Fischer, 1973 and Richard, 1975). While there is no arguing that men naturally care about their dependents and worry about their future security, we do not however see a flourishing market for life insurance in India, more so in the state of Andhra Pradesh. Between 2015-2022, bifurcated Andhra Pradesh has witnessed a mere 0.05 % growth in the amount of new life insurance premiums underwritten as against the 8.9 % growth in Telangana and 8.2 % growth in the national average.¹ As in the year 2022, Andhra Pradesh accounts for just 3.5% of the country's total new life insurance premiums, a clear decline from the 7.2% share it enjoyed in 2015. These statistics and the staggering growth of life insurance consumption in the state poses many questions – Are people in Andhra Pradesh risk lovers? Do they have other means of self-insurance, say bequeathed wealth and human capital, that renders the need to invest in life insurance policies redundant? Are there any economic, socio-cultural and demographic influences atypical to the population that governs their choice to buy life insurance? Queries like these require ascertaining what influences a household's decision to purchase or not to purchase life insurance, and this exactly what this study aims to do.

Stated otherwise, the objective of this study is to identify the factors influencing a buyer's decision to purchase life insurance in the coastal districts of Andhra Pradesh. Using survey data on a sample of 600 households across the three districts of Andhra Pradesh i.e. Visakhapatnam, Srikakulam, and East Godavari, this study analyses what motivates an individual's probability of getting his life insured. Separate district-wise regressions are also undertaken to further demarcate how consumption decisions tend to vary across socio-economic and demographic clusters.

¹ Computed using data from IRDAI, Handbook of Indian Insurance Statistics

The rest of the chapter goes as follows: Section 2 offers a review of canonical studies on consumption of life insurance from around the world, and Section 3 identifies reconcilable gaps in the literature. Section 4 describes the data sample and marks important observations. Section 5 deals with the empirical models and estimation techniques used while Section 6 discusses the results and their inferences. Section 7 concludes the study.

4.2 Review of Literature

Origins of the theoretical premise of the demand for life insurances can be traced back to the works of Yaari (1965), Hakanson (1969); Fischer (1973) and Richard (1975) who construe this demand as a constrained optimization problem – minimisation of uncertainties in a household's income owing to the demise of principal breadwinner, under constraints to rate of income and consumption spending. Like demand for any other commodity, the decision to buy life insurance is essentially a function of *income*. An individual's personal income is the earnings flow that pays the insurance premiums. To this end, life insurance purchase is a positive function of current income as is evidenced in studies by Hammond et al (1967), Mantis and Farmer (1968), Hakansson (1969), Campbell (1980), Lewis (1989), Truet and Truet (1990), Showers and Shotick (1994); Lienberg et al (2012) and Annamalah (2013). Nevertheless, the extent to which income can positively influence demand for life insurance is contingent on the consumers' risk tolerance. Fortune (1973) identifies that if a high income earning individual practices savings, the consequential wealth accumulated will decrease his aversion to risk in turn causing his need for life insurance to dwindle. Again, Hong and Rull (2012)'s finding that income has a negative influence on insurance purchase in middle-income groups but positive influence for higher-income groups subtly hints at the plausible non-linear association between the two. With propensity to save being low and cost of living being high, life insurance premiums might not be attractive options for the middle-income groups; but might provide attractive tax savings to the higher classes.

Besides income, *education* of the individual has been theorised to play a positive role in demand for life insurances. The more popular notion is that years of formal education provide greater awareness of the need for life insurance and aids meticulous future financial planning (Hammond, Houston and Melader, 1967; Burnet and Palmer, 1984; Truet and Truet, 1990; Annamalah, 2013). Nevertheless, in the backdrop of insurmountable inflation pressures, the educated might not consider life insurance as a rational purchase. This is corroborated by

Anderson and Nevin (1975) as their study finds a negative causal association between the husband's educational qualification and his demand for life insurance covers.

Extant studies share consensus that the decision to get life insurance is conditional on the effect that the insured's death can have on the future consumption of other household members. By getting his life insured, an individual guarantees financial security to the dependents. To this end, it is natural that presence of *additional earners* in the family offsets the need to look for any alternative financial security, in the event of one of the earner's untimely deaths. Indeed, Duker (1969) finds that households with a working spouse tend to buy significantly less life insurance contracts. Goldsmith (1983)'s study further adds that even if the spouse is not currently working but possesses the human capital to fulfil the role of providing for household needs, she significantly substitutes for life insurances.

An earning individual's purchase of life insurance over annuities is basically a transaction made on behalf of her beneficiaries – spouse and dependent children. Overlapping generations models for the US economy reveal that although having a spouse is costlier than staying single, *marriage* generates strong economies of scale over time for the joint couple. And so, in order to compensate for the benefits that would be lost in the event of death of a spouse, married couples tend to hold more life insurance than singles (Hong and Rull, 2007; Hong and Rull, 2012; Leibenberg, 2012; Heao et al, 2013). The demarcation between singles and married is, however, not that relevant if one accounts for singles with dependents. All households care about their *dependent's* long-term wellbeing, practice some level of altruism and have an operational bequest motive, as argued by Hakanson (1969) and Hong and Rull (2012). To this end, studies by Hammond et al (1967), Beenstock (1968) and Lienberg et al (2012) find a positive association between the number of dependents of a policy holder and his/her consumption of life insurance. However, the bequest motive for purchasing life insurance is constrained by the household costs of dependents. For instance, dependent children are found to be exorbitantly pricey in US households, more so if they are not yet adults and not contributing anything to the household in terms of earnings or home production. Consequently, with children who are not yet adults, the household has to spend more to beget the same level of utility as that enjoyed by a childless household. This in turn means less savings and less investment in life insurances, as empirically supported by Hong and Rull (2012); Ferber and Lee (1980) and Goldsmith (1983).

The child effect also explains why studies by Berekson (1972); Truett and Truett (1990); Showers and Shotick (1994); (Hong and Rull, 2012) and Annamalah (2013) find *age* to be a positive determinant of life insurance consumption. Individuals in their 40s and 50s have greater odds of buying insurance than young individuals in their 20s. Assuming a typical individual gets married and/or rears a child in their 20s and 30s, their children would outgrow the dependency stage by the time the individuals reach their 40s, allowing them to have enough to save and invest for life insurances. In contrast, Hammond et al (1967) reason that an advancing age is associated with higher cost of life insurance premiums and hence a lesser need for insurance protection as dependents become self-supporting. The negative age effect is also supported by Lin and Grace (2007) where they argue that an older family is much less financially vulnerable to the death of its prime breadwinner than a younger family. Also, older families, having already acquired a certain amount of wealth, are comparatively less risk averse and have lesser incentive to purchase life insurance.

Narrowing down to the Indian context, similar micro level studies on the demand for life insurance is scant and more recent. A static cross-sectional study for the year 2004-05 on Indian households by Kakar and Shukla (2010) reveal individuals with higher income, higher education and salaried employment to show greater participation in life insurances. The *rural-urban divide* does not seem to assume importance. In contrast, Giri and Chatterjee (2021)'s dynamic study of thirty thousand Indian households from 2004-05 to 2011-12 find income to be a key determinant, but more so in urban households. Besides income, estimates show family size to be a positive predictor, and age and the event of marriage to be a negative predictor of the odds of buying life insurance.

4.3. Research Gaps:

In summary, existing scholarship offer a rich account on the determinants of life insurance purchase but then again, their results are non-reconcilable for being context-specific. This non-generality iterates the need for constructing the exercise at regional and sub-national levels, which again have not gained prominence. Secondly, both the studies (Giri and Chatterjee (2018), Preethi and Rajesh (2010)) on Indian consumers inadvertently assume the target to be a homogenous mix. Demographics and socio-economic aspects vary across different regions of India, necessitating the need for region-specific explanation of life insurance buying decisions. Thirdly, the contrasting conclusions from the two Indian studies on the rural-urban divide call for a revisit of the phenomenon. Through its enquiry, the

present study aims to reconcile these gaps in the existing literature. The broad objective of this study is to identify the key factors influencing a buyer's decision to purchase life insurance in the coastal districts of Andhra Pradesh.

4.4 Data and Sample Profile:

The study is based on primary data collected from three coastal districts of Andhra Pradesh – Visakhapatnam, East Godavari and Srikakulam.

Our dependent variable of interest is a dichotomous variable representing participation and non-participation in life insurance (*INS*). Of the explanatory variables considered, annual personal income (*Y*) and number of earners in the family (*EARN*) are continuous variables. Data on marital status (*M*) has been grouped under two categories – *single* and *married*. This is a deviation from global studies that explicitly consider the different categories of 'married' - widowed, divorced and remarried. However, in the context of traditional Indian societies where individuals do not change their marital status as often as it happens in developed societies, our simple single-married categorisation is more rational. A respondent has been categorised as 'single' if she has never been legally married, and as 'married' if she has been legally married at least once irrespective of what the status of her marriage currently is. Data on the number of children owned (*CHILD*) had visible outliers with respondents reporting a maximum of 7 children. As we shall subsequently see, our econometric model is sensitive to the presence of outliers and skewness. To make the *CHILD* variable amenable to valid estimations, it was construed as a categorical variable with four categories – *0 children*, *1 child*, *2 children* and *>2 children*. The rest of the variables and the sample's distribution across the variables are listed in Table 4.1.

Table 4.1: Sample Breakdown by Characteristics or Variables

<i>Variable</i>	<i>Category</i>	<i>Number</i>	<i>%</i>	<i>Variable</i>	<i>Category</i>	<i>Number</i>	<i>%</i>
INS	Not Insured	199	33.1	GENDER	Male	470	78.2
	Insured	402	66.9		Female	131	21.8
Y Group*	low	98	20.1	OCC	agriculture	95	15.8
	low. mid	59	12.1		business	154	25.6
	upper. Mid	40	8.2		service	283	47.1
	high	290	59.6		dependents	69	11.5

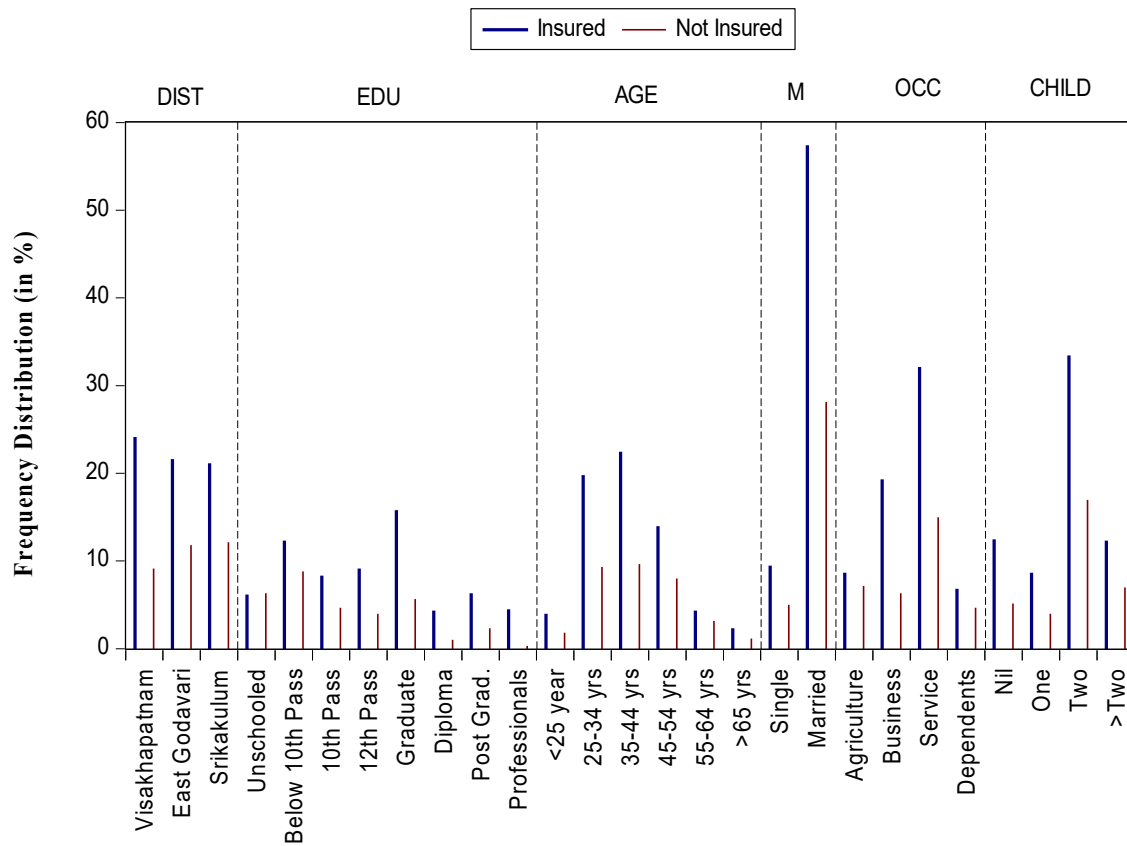
PROP	Yes	393	65.4	M	single	87	14.5
	No	208	34.6		married	514	85.5
EARN	One	297	49.4	CHILD	nil	106	17.6
	Two	212	35.3		one	76	12.7
	Three	52	8.7		two	303	50.4
	> Three	40	6.7		> two	116	19.3
EDU	unschooled	75	12.5	REG	rural	370	61.6
	below 10th	127	21.1		urban	231	38.4
	10th pass	78	13.0	AGE	<25 y	35	5.8
	12th pass	79	13.1		25-34 y	175	29.1
	graduate	129	21.5		35-44 y	193	32.1
	diploma	32	5.3		45-54 y	132	22.0
	post grad	52	8.7		55-64 y	45	7.5
	professional	29	4.8		>65 y	21	3.5

**Grouped as per categorisation of incomes by Pradhan Mantri Awas Yojana (2022)*

As noted, 67% of the sample population have acquired life insurance. The sample is dominated by high-income earning individuals (60%), real estate or land property owners (65%), and individuals who are sole earning members in their households (49.5 %). As far as the socio-cultural characteristic of the sample is concerned, a significant proportion of them are married (85 %) and own at least one kid (82.4 %). Interestingly, despite the sample being more representative of the rural population in Andhra Pradesh (61.6 %), most of the respondents are service professionals (47.1 %).

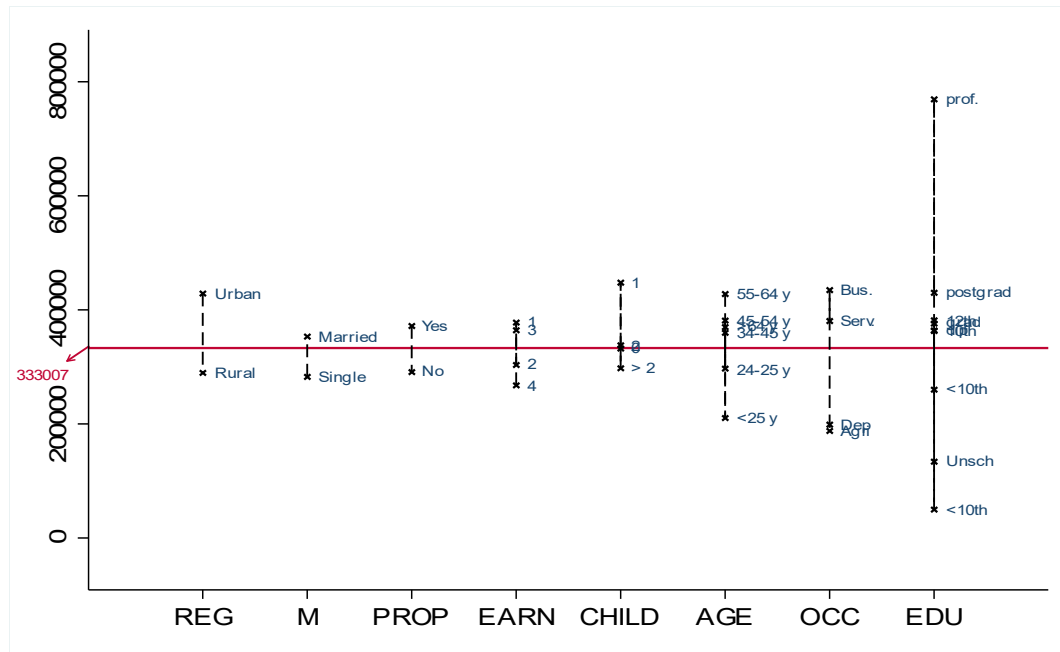
Figure 4.1 gives a comparative picture of the insured and non-insured individuals across the select set of socio-economic, demographic and regional characteristics. Of the 67 % insured households, a majority comes from the Visakhapatnam district (24%) followed by East Godavari (22 %) and Srikakulam (21%). Most of the life insured are graduates, married with two children, belong to the working age groups of 35-44 years and 25-34 years, are married or have been married at least once, and own two dependents or children. Occupation-wise, most of the insurance holders are service professionals.

Figure 4.1: Frequency Distribution of Insured and Non-Insured



Seeing the figure 4.2 as consumption of life insurance is touted as a function of income, we mark how socio-economic clusters in the sample differ with respect to income. Figure 4.2 cross-plots the average annual income of the group clusters. As the average annual income of an urban-based individual is greater than both the sample average and rural individuals. This explains why life insurance consumption is more a feature of urban and developed regions. This also points out at the low outreach of life insurance companies in the rural and remoted corners of the country. As expected, annual income of those in working-age groups are higher than young adults. The relatively high income of those in 50s to those in their 30s corroborates how income is also a function of years of experience. We find owners of land and real estates to have higher income compared to non-owners. It is interesting to note that businessmen earn more than the service holders, implying that the former is at a greater risk from loss of life and income.

Figure 4.2: Sample Breakdown by Personal Income



The fact that married individual earn more than singles blends well with the Indian social structure. Marriages in this country continue to be seen as a source of social security for the couple and hence a prospective groom/bride is expected to earn better than a not so prospective groom. To that end, the fact that married individuals, earn on an average, more than a single individual and more than the sample average is discernible.

Table 4.2 presents the correlation between the different variables. Since most of the variables used in the study are categorical variables, we employ the Cramer's V chi square test of independence, as devised by Cramer (1946), to measure how strongly the variables are associated. We use income groups instead of our continuous series on income to make the variable amenable to this test.

Table 4.2 : Correlation Matrix: Crammers' V

	<i>INS</i>	<i>Y Group</i>	<i>EDU</i>	<i>OCC</i>	<i>M</i>	<i>CHIL</i> <i>D</i>	<i>AGE</i>	<i>PROP</i>	<i>RE</i> <i>G</i>
<i>INS</i>	1*								
<i>Y Group</i>	0.34*	1							

EDU	0.22*	0.20*	1							
OCC	0.14*	0.21 *	0.24*	1						
M	0.012	0.05	0.22*	0.19 *	1					
CHILD	0.04	0.06	0.24*	0.17 *	0.81*	1				
AGE	0.07	0.13	0.16 *	0.23*	0.65*	0.40*	1			
		0.08					0.12			
PROP	0.08		0.11	0.14*	0.03	0.05	*	1		
REGIO							0.15			
N	0.09*	0.16*	0.24*	0.31*	-0.01	0.10	*	0.16	*	1

* show significance at less than 5 % level of significance

Results reveal a strong association between marriage and children (0.81) and between marriage and age (0.65). No strong association is unravelled for the rest of the categories. But since, correlation does not exactly reveal causation and the purpose of this study is to unravel the causal explanations behind the choice to get life insured, we proceed with a regression analysis in the next section.

4.5 Model Specification and Estimation:

A typical buyer's decision to get life insurance is our phenomenon of interest and we want to be able to tell what explains such decisions. Following from the existing state of literature, we hypothesize that the decision to get one's life insured is influenced by a host of economic, social and demographic factors; and our empirical analysis aims at identifying which of these factors have a significant bearing when it comes to explaining life insurance buying decisions in the select districts of Andhra Pradesh. Our preliminary analysis entailed construction of different economic models using step wise back regressions in order to test the significance and relative importance of each theorised explanatory variables. It was through this iterative exercise that the final baseline economic model was deduced.

Our baseline *economic model* describes the i^{th} individual's decision to buy life insurance (*INS*) as a function of her annual income (*Y*), level of educational attainment (*EDU*), age (*AGE*), marital status (*M*), number of children owned (*CHILD*), number of earners in the

family (*ERN*), type of occupation held (*OCC*), and ownership of property or real estates (*PROP*).

That is, we model –

$$INS_i = f(\mathbf{X}) = f(\log Y_i, EDU_i, AGE_i, M_i, CHILD_i, OCC_i, ERN_i, PROP_i) \quad (i)$$

where,

$$INS_i = \begin{cases} 1, & \text{if life insured} \\ 0, & \text{if not insured} \end{cases} \quad \text{for all } i's$$

As is evident, since the dependent variable *INS* is a discrete dichotomous outcome variable taking values 0 and 1 only, equation (i) assumes the structure of a *probability model*. The model can, hence, be rewritten as –

$$\Pr(INS_i = 1 | \mathbf{X}_i) = f(\mathbf{X}_i) = f(\log Y_i, EDU_i, AGE_i, M_i, CHILD_i, OCC_i, ERN_i, PROP_i) \quad (ii)$$

implying that the probability of getting life insured is a function of the hypothesized independent variables. Among these variables, *logY* and *ERN* are continuous variables; *M* and *PROP* are binary categorical variables while *EDU*, *AGE*, *CHILD* and *OCC* are *k*-categorical variables with $k > 2$. For each of these *k*-categorical variables, $k - 1$ dummies have been employed.

When it comes to the explicit functional form and econometric specification of probability models, assuming a linear function and then running OLS regression fails to produce practical estimates. This is because there is nothing in linear regression models that can necessarily constrain the fitted values (in this case predicted probabilities) to be bound between 0 and 1. The standard alternative is to use a logit or a probit transformation of the linear model and then fit regression lines that resemble a logistic or a normal cumulative distribution function (c.d.f), respectively. Between logit and probit, the latter tends to fit better only when there are extreme number of observations in the tails, a qualification that our study does not clear. As such, we consider the logit representation for our study.

Our *econometric model*, thus, takes the following form –

$$\begin{aligned} \Pr(INS_i = 1 | \mathbf{X}_i) &= F(\mathbf{X}_i) + \mu_i \\ &= F(\beta_0 + \beta_1 \log Y_i + \beta_2 EDU_i + \beta_3 AGE_i + \beta_4 M_i + \beta_5 OCC_i + \\ &\quad \beta_6 ERN_i + \beta_7 CHILD_i + \beta_8 PROP_i) + \mu_i \end{aligned} \quad (ii)$$

where,

$$F(\mathbf{X}_i) = \frac{1}{1+e^{-X_i}} \text{ is the cumulative logistic function.}$$

In logit models, the β_j coefficients in Equation (iii) are in the metric of log odds i.e. the natural log of odd ratio. The $\beta_j = \ln \left(\frac{\Pr(INS=1)}{1-\Pr(INS=1)} \right)$ for continuous variables show the expected change in the log odds of getting insured per unit change in the j^{th} variable, ceteris paribus. In case of categorical variables, they measure the expected difference in log odds of the k^{th} category against the base category. All β_j 's when exponentiated give back the odd ratios i.e., $e^{\beta_j} = \frac{\Pr(INS=1)}{1-\Pr(INS=1)}$, allowing greater ease of interpretation. Literally, if $\beta_j > 0$ (or $e^{\beta_j} > 1$) it would imply that as j^{th} variable increases, the probability of falling in the target group $INS = 1$ increases by β_j units. While if $\beta_j < 0$ (or $e^{\beta_j} < 1$), the probability of falling in target group $INS = 1$ decreases.

The baseline model in equation (iii) is also extended to include the district dummy (*DIST*) in order to capture plausible disparities in the probabilities of getting insured across the three districts. As per Census 2011, the rural-urban divide in Visakhapatnam is almost proportionate while Srikakulam and East Godavari have rural population of 83% and 75%, respectively. To that end, while Srikakulam and East Godavari can be viewed as being principally representative of the rural population, Visakhapatnam tends to proxy for the urban lot and so the latter has been taken as the base category for the *DIST* variable. This gives us our second model –

$$\begin{aligned} \Pr(INS_i = 1|\mathbf{X}_i) &= F(\mathbf{X}_i) + \mu_i \\ &= F(\beta_0 + \beta_1 \log Y_i + \beta_2 EDU_i + \beta_3 AGE_i + \beta_4 M_i + \beta_5 OCC_i + \\ &\quad \beta_6 ERN_i + \beta_7 CHILD_i + \beta_8 PROP_i + \beta_9 \mathbf{DIST}_i) + \mu_i \end{aligned} \quad (iv)$$

where,

$$F(\mathbf{X}_i) = \frac{1}{1 + e^{-X_i}}$$

Equations (iii) and (iv) are the models used on the aggregate sample of 600 observations from the three districts. Besides, we also run separate sub-regressions for the 200 sample units from each of the three districts in order to probe further the differential explanations of

the phenomenon of getting insured in the districts, if any. The sub-regression model follows the baseline structure except that it replaces the *DIST* variable with the *REG* variable to capture the rural-urban significance within the districts. The sub-regression model, thus, can be written as

$$\begin{aligned}\Pr(INS_i = 1|X_i) &= F(X_i) + \mu_i \\ &= F(\beta_0 + \beta_1 \log Y_i + \beta_2 EDU_i + \beta_3 AGE_i + \beta_4 M_i + \beta_5 OCC_i + \\ &\quad \beta_6 ERN_i + \beta_7 CHILD_i + \beta_8 PROP_i + \beta_9 \mathbf{REG}) + \mu_i \quad (v) \\ &\quad \text{for } i = \{1, 2, \dots, 200\}\end{aligned}$$

where,

$$F(X_i) = \frac{1}{1 + e^{-X_i}}$$

All the three models mentioned in equations (iii), (iv) and (v) have been estimated using the Maximum Likelihood Estimation technique. Clustered-robust standard errors have been used to account for the heterogeneity across the districts (in case of the aggregate models) and across regions (in case of the district-specific models). The **Hosmer-Lemeshow Chi-square test** is used to assess the goodness of fit of all models. Sensitivity tests are also run to adjudge to what extent the fitted model correctly classifies the observed incidences of getting insured. Again, the validity of the models and the estimates are conditional to satisfaction of the assumptions of logistic regressions. Accordingly, each model has been treated to a series of diagnostic tests to verify their validity. **Link test** is used to detect model misspecifications in terms of the link function used and in terms of omitted variables. The **Box-Tidwell** is used to test variable misspecification. The test remodels the predictors using power transformations and finds the best power for model. The null for each transformed β is that the associated predictor variable has a linear association with the regressand. Rejection of the null would then imply non-linear specification of the variable. Following from the results of these specification tests, a quadratic term for $\log Y$ was additionally introduced in model (v) for the Visakhapatnam district. But since, $\log Y$ and $(\log Y)^2$ are clearly highly correlated, square of the centered $\log Y$ i.e. $(\log Y - \overline{\log Y})^2$ is used as a proxy for $(\log Y)^2$ to evade the issue of multicollinearity. With presence of categorical variables, VIFs and tolerance statistics cannot be employed for estimating multicollinearity. Nevertheless, the program algorithm (STATA 15) used for model estimation automatically detects and drops collinear variables.

4.6 Results and Discussion:

4.6.1 Aggregate Findings:

First, our theorised model outlined in equation (iii) and (iv) for the aggregate sample of 600 observations from across the three districts is tested and estimated. The initial round of logit regressions takes the level *unschooled* as the base-category for the educational attainment variable (*EDU*), *single* as the base for marital status (*M*), *agriculture* as the base for the occupation variable (*OCC*), *<25 years* as the base for age groups (*AGE*), 0 children as the base for *CHILD*, and *ownership* as the base for the property ownership (*PROP*). The seeming impracticality and biased intuitiveness of comparing the insurance decisions of *unschooled* respondents with highly qualified or educated respondents, and/or seemingly unearning 24-year-olds with earning 45-year-olds motivate a second round of regressions where we rebase the *EDU*, *AGE* and *OCC* variables to take *12th pass*, *45-55 years* and *service* categories as bases respectively. Results of first round of regressions are contained in panel (a) of Table 4.1 while that from the second ones are contained in panel (b). As previously mentioned, cluster-robust standard errors are used to secure the maximum likelihood estimates of the model coefficients (β_j). The Wald z test statistics are employed for testing the null $H_0: \beta_j = 0$.

Income:

We begin with estimates of the economic variables. Income (*logY*), as expected, is a positive and strongly significant predictor of the probability of getting insured. Summarising the coefficient from all the four regressions tabulated in panel (a) and (b), it appears that a percentage increase in one's annual income increases the chances of buying insurance by 0.26 – 0.38 units. Clearly, high-income households have higher odds of going for life insurance – *firstly* because they can afford it, and *secondly* because high incomes warrant greater protection from risk of death so as to offset potential loss in the household's standard of living.

Number of Earners:

The other economic variable, i.e. number of earning members (*EARN*) turns out to be a negative predictor, as is consistent with literature from the rest of the world but unexplored by Indian studies. Basically, although an increase in one's own income improves her odds of choosing life insurance, the odds of doing the same decreases when there are more earning members contributing to the family's wealth. One can safely infer that individuals view

earning members as alternative sources of social security on whom the nominee(s) can bank on in the event of untimely death of the head. In fact, it can be argued that this is truer for the study population since stronger familial ties and trust is characteristic of pan-Indian households. Between personal income (*logY*) and earning members (*EARN*), the former has stronger influence on life insurance buying decisions.

Table 4.3 Results of Logit Regressions: Aggregate Model

Model Estimates								
Variables	(a)				(b)			
	<i>Without DIST dummy</i>		<i>With DIST dummy</i>		<i>Without DIST dummy</i>		<i>With DIST dummy</i>	
	<i>Log Odds</i>	<i>P>z</i>	<i>Log Odds</i>	<i>P>z</i>	<i>Log Odds</i>	<i>P>z</i>	<i>Log Odds</i>	<i>P>z</i>
constant	-2.31***	0.00	-3.16***	0.00	-2.33***	0.00	-3.21	0.00
logY	0.27**	0.01	0.38***	0.00	0.27***	0.01	0.38	0.00
EDU								
<i>unschool ed</i>					-0.61***	0.00	-0.62***	0.00
<i>below 10th</i>	0.22*	0.05	0.27**	0.04	-0.40***	0.00	-0.35***	0.00
<i>10th pass</i>	0.32	0.30	0.33	0.30	-0.29	0.45	-0.29	0.47
<i>12th pass</i>	0.61***	0.00	0.62***	0.00				
<i>graduate</i>	0.86*	0.09	0.80	0.13	0.25	0.54	0.18	0.66
<i>diploma</i>	1.30***	0.00	1.10***	0.00	0.68	0.10	0.48	0.21
<i>post grad</i>	0.81	0.21	0.89	0.23	0.20	0.73	0.27	0.67
<i>profession al</i>	2.15***	0.00	2.32***	0.00	1.53***	0.00	1.70***	0.00
AGE								
<25 y					0.57*	0.05	0.55*	0.05
25-34 y	-0.37	0.10	-0.44	0.02	0.20	0.11	0.11	0.49
35-44 y	-0.22	0.43	-0.24	0.38	0.34*	0.06	0.31*	0.09
45-54 y	-0.57*	0.05	-0.55*	0.05				
55-64 y	-0.82*	0.07	-0.87**	0.03	-0.25	0.49	-0.32	0.38
>65 y	-0.46**	0.02	-0.50**	0.00	0.11	0.37	0.05	0.69
M	0.79**	0.02	0.68*	0.06	0.79**	0.02	0.68*	0.06
EARN	-0.21***	0.00	-0.19***	0.00	-0.21***	0.00	-0.19***	0.00
CHILD								
<i>one</i>	-0.62***	0.00	-0.60***	0.00	-0.62***	0.00	-0.60***	0.00
<i>two</i>	-0.58*	0.08	-0.56	0.12	-0.58*	0.08	-0.56	0.12

>two	-0.23	0.59	-0.25	0.57	-0.23	0.59	-0.25	0.57
OCC								
agriculture					0.07	0.83	0.11	0.71
business	0.46***	0.00	0.40***	0.00	0.53**	0.01	0.52**	0.02
service	-0.07	0.83	-0.11	0.71				
dependents	0.00	0.99	0.10	0.66	0.07	0.83	0.21	0.50
PROP	-0.22	0.57	-0.20	0.61	-0.22	0.57	-0.20	0.61
DIST								
E. Godavari			-0.42***	0.00			-0.42***	0.00
Srikakulam			-0.83***	0.00			-0.83***	0.00
Model Fit and Prediction Accuracy								
Pseudo- R^2	0.07		0.09		0.07		0.09	
H-L χ^2	8.98 (0.34)		6.78 (0.56)		8.98 (0.34)		6.78 (0.56)	
Correct Cl.	68.50%		68.89%		68.50%		68.89%	
AUROC	0.69		0.70		0.69		0.70	

*, **, *** signify rejection of the null at 10%, 5% and 1% levels of significance, respectively.

Education Levels:

In line with theory, results show that larger the number of years spent in formal education, greater is the probability of buying life insurance. The β coefficients in panel (a) for the *EDU* variable reports the difference in log odds when compared to *unschooled* individuals. The positive β coefficients reveal that all other educational levels have greater odds of getting insured than *unschooled* individuals, with the differential magnitude being higher for higher levels of educational qualification. However, better intuition is secured by changing the reference category to *12th pass*, results of which are reported in panel (b). Compared to a *12th pass*, an *unschooled* and a *<10th pass* has statistically significant lower odds of getting

insured. The difference is larger in case of *unschooled* than $<10^{th}$ pass, as expected. More importantly, compared to a 12^{th} pass, only a *professional* has a statistically significant higher odd of choosing life insurance. A *professional* has about 1.5 to 1.7 units incremental chance of getting insured than a 12^{th} pass. It needs to be noted that till the advent of the New Education Policy (2020), the educational curriculum in India (more so in Andhra Pradesh) largely ignored financial education. Thus, the *EDU* variable in our study context cannot be treated as synonymous to financial literacy; and this plausibly explains why being a mere *graduate* or *post graduate* does not significantly influence insurance planning, when compared to the school pass out.

Occupation:

Occupation wise, individuals engaged in *business* have significantly higher odds of getting insured than both the *agriculturally* engaged and the *service* employed as suggested by panel (a) and (b), respectively. This is a departure from Kakar and Shukla (2010)'s pan India estimates which show greater participation in life insurances by the salaried employed, which in our categorisation would be synonymous to service employed. Plausible explanations of our finding can be stated as follows – As shown in Fig 4.2, the average income of businessmen in our study area exceeds that of service holders, such that the higher odds of businessmen over servicemen basically reestablishes the previous finding that high-income classes buy more insurance. *Secondly*, life insurance decisions of the salaried is largely motivated by its tax-saving benefits. With the average annual gross income of the salaried in our study being < 4 lacs, the maximum tax liability would be $<10k$ (assuming 0 exemptions). It is unlikely for the typical servicemen to bear the cost of insurance premiums to offset an annual tax of less than 10k. *Third*, the business community have other motives, besides tax-saving, to invest in life insurance. The self-employed, small business owners and entrepreneurs face a higher risk of financial instability than the salaried employed. Lack of entitlement to adequate social security benefits and protection schemes (like pension) for these business dependent households imply that they are a comparatively at a higher social risk, thus increasing their demand for private life insurances.

Number of Children:

Another finding that sticks out from existing studies is the influence of children (*CHILD*). As reported, the life event of owning a child (or two) decreases the likelihood of getting insured, when compared to the event of not having any children. Granting this empirical finding

seems to counter the bequest motive behind life insurance, a negative impact of the CHILD predictor is not altogether unthinkable for the population under study. *Firstly*, traditional and agrarian societies of India view children as successors to the family head. The expectation that children in the family would take over the head's role and look after the family's financial and social security, in the event of the head's death, causes children to be treated as substitutes to life insurance. *Secondly*, the act of purchasing life insurance is constrained by the household costs of dependents. With rising costs of education and soaring commodity prices, rearing children may limit the scope and demand for investing in insurance.

Marriage:

Consistent with theory, results show that married individuals (M) have greater odds of getting life insured than the referenced singles. As is the case for countries like US, in India too married couples enjoy various legal benefits – joint filing of taxes, tax deductions through asset transfers, and other social security benefits for each other; all of which goes for a toss with the death of the spouse. Life insurance acts as a risk against this potential loss of benefits. The argument is supplemented by the fact that 51 % of the married individuals in our study do not have a working spouse, thus, necessitating the need for life insurance schemes.

AGE:

Results find growing AGE to be a negative predictor of life insurance acquisition. The β coefficients for the AGE variable in panel (a) of Table 4.2 are all negative, thereby intimating that compared to a *25-year-old*, older people have less likelihood of getting life insured. Changing the reference category to the peaked working-class age group of *45–54 years* reveal people in their 20s and 30s have higher odds of getting insured. In summary, younger people have a greater tendency to buy life insurance. This owes from the established fact that ageing is associated with (i) higher cost of life insurance premiums and with children turning self-dependent, both the need and demand for life insurance protection dulls.

DISTRICT:

Introduction of the district dummies (DIST) turns out to be strongly significant in either set of regressions. The negative coefficients indicate that compared to Visakhapatnam, individuals from both Srikakulam and East Godavari have lower odds of getting insured. As mentioned earlier, with Visakhapatnam being more urban, this distinction hints at the rural-urban

disparity in demand for life insurance with urban dwellers showing greater tendency to get insured.

The bottom panel of Table 4.3 includes assessment of the model fit and predictive accuracy. The Hosmer-Lemeshow (χ^2) test statistic on the null of good fit is reported along with the exact level of significance in parenthesis (). With the probabilities for all the models being greater than 10 percent; our models pass the goodness of fit tests. As a complement, model fits are also adjudged on the basis of area under Receiver Operating Characteristics (AUROC). The range of AUROC is between 0 to 1, with 1 indicating a perfect fit and 0 otherwise. The AUROC clearly shows that introduction of the DIST dummy provides a better fit. Finally, *Correct Cl.* acts as a summarised sensitivity and specificity indicator that reveals to what extent the predicted probabilities match the observed probabilities. Our models correctly classified 65-69% of the actual event of getting life insured.

Table 4.4 Model Mis-Specification Tests: Aggregate Model

	(a)				(b)			
	<i>Without DIST dummy</i>		<i>With DIST dummy</i>		<i>Without DIST dummy</i>		<i>With DIST dummy</i>	
	<i>statistic</i>	<i>Prob.</i>	<i>statistic</i>	<i>Prob.</i>	<i>statistic</i>	<i>Prob.</i>	<i>statistic</i>	<i>Prob.</i>
Link Test								
<i>p</i>	0.94***	0.00	1.01***	0.00	0.94***	0.00	1.01***	0.00
<i>p</i> ²	0.04	0.79	-0.01	0.95	0.04	0.79	-0.01	0.95
Box-Tidwell								
<i>logY</i>	2.08	0.14			2.08	0.14		
<i>EARN</i>	0.21	0.64			0.21	0.64		

*, **, *** signify rejection of the null at 10%, 5% and 1% levels of significance, respectively.

Validity of our model estimates require that the underlying model follow the assumptions of logit regressions. Results of model specification test on equation (iii) and (iv) for the aggregate sample is reported in Table 4.4. The link test is built on the null that the logit function is the right link function to use and that relevant predictors have not been left out.

With the predicted value (p) being strongly significant and the square of predicted value (p^2) not being significant for our models, it is inferred that our logit modelling and variable specification holds valid. Validity of variable specification is also corroborated by the Box-Tidwell test. After introducing squared terms of the continuous predictors i.e. income and earnings, the test fails to reject the null that the two variables should be in linear terms. In summary, our findings from the aggregate model hold valid.

4.6.2 District-Specific Findings:

For greater insights into what explains the difference in life insurance purchase decisions between the three districts, separate logit models are constructed for each of the three districts, as spelt out in equation (v). Motivated from the intuitive advantage of using *12th pass*, *45-54 years* and *service* as base categories of *EDU*, *AGE* and *OCC* variable respectively, we use them as benchmarks for the district-wise regressions. Also, following the insight from the aggregate model on rural-urban divide an additional dummy variable (REG) is introduced which assumes value 0 for rural-based individuals and 1 for urban-based individuals. Due to the failure of model (v) to pass link test for Visakhapatnam, the centered quadratic income term has been introduced as an additional explanatory variable; following which it trumps the misspecification test. The consequential district-based model results are tabulated in Table 4.4. Perfect identification has caused the model to drop categories that perfectly predict $INS = 1$. The lower panel of Table 4.4 also reports outcomes of the specification and model fit tests.

Results show that while Srikakulam and East Godavari mirror the findings of the aggregate model, Visakhapatnam's life insurance explanation departs from the two in significant ways. Both $\log Y$ and $(\log Y)^2$ is significant for the district of Visakhapatnam, but $\log Y$ is a negative predictor of getting life insured for Visakhapatnam, unlike in the case of East Godavari and Srikakulam. Impact of educational levels (*EDU*) is same across the three districts, with lower levels of education showing lower odds of buying life insurance than the referenced *12th pass*. *Professionals*, *graduates* and *post graduates* on the other hand show higher odds. *AGE*, marital status (*M*) and number of children (*CHILD*) are not a significant predictors of life insurance demand in Visakhapatnam. In the other two districts though, they have the same effect as in the aggregate model. Ageing is a negative predictor of life insurance in Srikakulam and East Godavari with individuals below the referenced age group *45-54 years* exhibiting higher odds of going for insurance than individuals in their 50s. Also, married

individuals in these two districts have incremental odds of 1.6 – 1.8 units over single individuals when it comes to buying life insurance. Occupation-wise, compared to a *service-employed*, individuals in agriculture have lower odds of buying insurance in both Visakhapatnam and Srikakulam. The statistically higher odds of *business holders* over *service* employed found for the aggregate model appears to be more of a characteristic of the district of Visakhapatnam. Wealth-wise, higher number of earners (*EARN*) in the family significantly offsets the odds for buying life-insurance across all three districts; thus, generalising the conjecture that earning members themselves serve as a means of social and financial security. Real estate (*PROP*), by virtue of being long-term financial assets, are also expected to act as substitutes for life insurance. But while they do so in Srikakulam, *PROP* ownership turns out to be a positive predictor for Visakhapatnam.

We argue that these stark differences between life insurance buying decisions of Visakhapatnam on one side and Srikakulam and East Godavari on the other owe to the urban representation of the former and rural nature of the latter two. Indeed, resonating with the aggregate model findings, the rural-urban dummy (*REG*) is statistically significant and positive for all the districts, thus, intimating that the urban dwellers have higher odds of getting insured than the rural. To this end, the following set of key findings emerge from the district-level regressions:

- a. In the more urban-oriented district of Visakhapatnam, the association between income and purchase of life insurance takes an inverted-U shape wherein an increase in income reduces the odds of getting life insurance at lower-income levels but intensifications the odds at higher-income levels. This phenomenon might be explained by the incidence of high propensity to consume at low-income levels which constrain savings and subsequently insurance investments. A typical low-income earning individual would choose household consumption costs over the cost of insurance. For a high-income earning individual though, both the high risk of loss from death and the need for tax-savings makes life insurance a lucrative investment.
- b. With urban districts offering better scale and earning scope for businesses and self-employed ventures, businessmen have higher odds to go for insurance than the typical servicemen. Having inferred that, the detail that an average businessman in urbane Visakhapatnam earns less than a professional suggests a higher risk-averse effect than an income effect on life insurance purchase decision of business households. The rural districts, on the other hand are characteristic of small

businesses, shop keepers and gig workers who do not have a stable earnings flow to pay regular insurance premiums.

- c. The insignificance of marriage and child ownership in Visakhapatnam on one-side coupled with the positive impact of property ownership suggests that in the more urban dwellings where more people are engaged in the service sector, demand for life.

Table 4.5: Results of District-Wise Logit Regressions

Model Estimates						
Variables	<i>Visakhapatnam</i>		<i>East Godavari</i>		<i>Srikakulam</i>	
	Log Odds	P>z	Log Odds	P>z	Log Odds	P>z
constant	0.59	0.89	-3.41**	0.03	-3.03**	0.00
Log Y	-0.02*	0.08	0.50***	0.00	0.34***	0.00
(Log Y) ²	0.22***	0.00				
EDU						
<i>unschooled</i>	-0.83***	0.00	-0.32	0.64	-0.32	0.81
<i><10th pass</i>	-0.36***	0.00	-0.53***	0.00	-0.15***	0.00
<i>10th pass</i>	-0.92**	0.02	-0.68	0.13	0.75	0.17
<i>graduate</i>	0.80	0.31	0.67***	0.00	0.44	0.29
<i>post grad.</i>	0.46***	0.03	0.19	0.78		
<i>diploma</i>			0.37***	0.00	-0.77	0.14
<i>professional</i>					1.59***	0.00
AGE						
<i><25 yrs</i>	-0.35	0.52	1.02**	0.019	1.19	0.10
<i>25-34 yrs</i>	-0.17	0.87	0.10	0.254	0.51	0.16
<i>35-44 yrs</i>	0.08	0.93	0.22	0.104	0.72***	0.00
<i>55-64 yrs</i>	-0.51	0.51	-0.83***	0.00	-0.30**	0.02
<i>>64 yrs</i>	-0.25	0.62	0.02	0.981	0.30	0.11

M	0.58	0.52	1.61***	0.00	1.81**	0.07
EARN	-0.23***	0.00	-0.33***	0.00	-0.18**	0.02
CHILD2						
<i>One</i>	-0.88	0.53	-1.53*	0.06	-1.42***	0.00
<i>Two</i>	-0.52	0.67	-1.89***	0.000	-1.19**	0.01
<i>>Two</i>	-0.05	0.96	-1.27***	0.000	-1.37***	0.00
OCC						
<i>agriculture</i>	-0.51***	0.00	-0.12	0.883	-0.71**	0.01
<i>business</i>	0.87***	0.00	0.20	0.642	0.27	0.63
<i>dependents</i>	0.66	0.21	-0.73**	0.039	0.14	0.82
PROP	0.32***	0.00	-0.85	0.195	-1.08***	0.00
REG	0.33***	0.00	0.67***	0.00	0.12**	0.08
Model Fit, Prediction Accuracy and Specification Tests						
Pseudo R	0.09		0.14		0.16	
H-M	4.72 (0.78)		4.19 (0.83)		4.41 (0.89)	
AUROC	0.76		0.74		0.75	
Correct Cl.	78%		68.98		70.41	
Link Test						
p	1.06 (0.05)		1.03 (0.00)		1.02 (0.00)	
Link Test						
p^2	-0.03 (0.91)		-0.03 (0.87)		-0.02 (0.88)	

insurance is driven less by the bequest motive and more by its tax-saving benefits.

- d. The rural-angled districts of Srikakulam and East Godavari continue to exhibit agrarian family dynamics in the sense that children and real estates are seen as sources of the household's future wealth, thereby substituting the need and desire for life insurance covers. But while children are viewed as providers of social security, the spouse is always seen as a dependent in such set-ups so much so that individuals are willing to buy insurance in order to provide for the spouse after death.

4.7 Conclusion

Using primary survey data on households from across three districts of coastal Andhra Pradesh, this study attempts to identify the proximate determinants of the decision to buy life insurance. The emphasis is on discerning the determinants and explanations that are general as well as specific to the population and region under study. Among other things, results show that the decision to buy life insurance is a positive function of income but then this effect is subject to the income-group in question. In case of regions with high-income disparities like Visakhapatnam, low-income groups have a negative tendency to go for life insurance and it is only a feature of high-income earning individuals. More importantly, the decision to buy life insurance is found to be a more pronounced function of socio-demographic aspects. Owing to children being viewed as potential human capital that can provide for the family's financial security in the future, the event of owing children results in low odds of getting life insured. Our robust finding that urban individuals have a greater tendency to go for insurance resonates the need to diversify the market to suit the needs and risks of rural population in the state, and the country.

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Chapter Five

On Life Insurance Demand in India: Key Influences

5.1 Introduction

What life insurance means to an individual is different from what it means to the nation at large. Individuals regard life insurance as a commodity or service, demand for which principally stems from their instinct of stability and concern over the uncertainty of leaving their loved ones deprived of the current standard of living (Yaari, 1965; Hakansson, 1969; Lewis, 1989; Richard, 1975). The nation, however, goes beyond to regard life insurance as a set of financial transactions that mobilize savings, fund capital markets, allow reallocation of resources and reinvestments in private and public sector projects (Ripoll, 1981; Beck & Webb, 2002). Indeed, studies have empirically ascertained the contribution of life insurance in the financial development and economic growth of the country in the long haul (Arena, 2008; Ward & Zurbrugg, 2002; Hou, Chen, & Yu, 2012; Outreville F. , 2013).

The life insurance market in India underwent a sea change with the advent of neo-liberal reforms in 1999 which ushered an era of market orientation, privatisation, foreign investments, competition and consequent product and distributional innovations. The sector has come a long way today and in the year 2022 claimed a market of \$100.4 billion. It is further projected to achieve a CAGR of 12% during 2023-27 (Global Data, 2023). These developments, however, do not blur the fact that the sector has been facing a shrinking market since the onset of the Global Financial Crisis. The decadal growth rate of gross life insurance premiums of the country dipped from a sound 23.5 % in 2000-2010 to about 4 % in 2010-2020. Table 5.1 outlines how the steady rise witnessed by the country's market for life insurance India in the 2000s, courtesy the supply-side reforms, gets overturned in the post-recession period. Per capita gross life insurance premium (density) registers a decadal growth of 5.1% in 2010-2020 compared to 21% growth in the previous decade. The share of life insurance premium to the country's GDP (penetration) faces a negative CAGR of -4.3 for the decade 2010-2020.

Table 5.1: Trends in India's Life Insurance Market (CAGR), 1980-2020

<i>Period</i>	<i>Density</i>	<i>Penetration</i>	<i>Gross Premium</i>
1980-90	15.4	2.4	15.6
1990-00	15.7	3.9	17.6
2000-10	20.9	10.7	23.5
2010-20	5.1	-4.3	3.8

Source: Computed using IRDAI database

Arresting the decline and sustaining the growth of life insurance market is instrumental for a robust savings and investment culture. A flourishing market for life insurance with greater public participation can further ease the state's burden of publicly funding social security and protection schemes, thus allowing efficient resource allocation and economic growth. To this end, it becomes imperative to question what exactly explains the demand for life insurance in India? Although this research question has found frequent attention in the academic space, this current study is fundamentally apart for it conscientiously shows how the demand for life insurance and the ability to pay for it share a non-linear, precisely an asymmetrical causal relationship.

The remainder of the chapter proceeds as follows – We begin with a brief discussion on the prospective determinants of a country's demand for life insurance, as conjectured by existing literature. Inspired by the literature and then guided by the statistical properties of the empirical data, estimable models are constructed in Section 3. Section 4 then presents the main findings and Section 5 concludes.

5.2 Explaining Life Insurance Demand and Penetration: A Review of Literature

Research on determinants for life insurance have generally assumed two discernible structures. The dominant stance has been to situate it within the context of consumption demand and maximisation of utility over the life-cycle of the insured. The less explored stance views life insurance as a form of savings, competing with other saving instruments in the market.

Origins of the consumption-based theoretical premise can be traced back to the works of Yaari (1965), Hakansson (1969), Fischer (1973) and Richard (1975) who construe a

household's demand for life insurance as a constrained optimization problem – minimisation of uncertainties in a household's income owing to the demise of principal breadwinner, under constraints to rate of income and consumption spending. Naturally then, like demand for any other commodity, the decision to buy life insurance is essentially a function of income. An individual's personal income is the earnings flow that pays the insurance premiums, and so consumption of life insurance purchase is a positive function of income. (Hammond, Houston, & Melander, 1967; Mantis & Farmer, 1968; Hakansson, 1969; Cargill & Troxel, 1979; Campbell, 1980; Lewis, 1989; Truett & Truett, 1990; Showers & Shotick, 1994; Outreville, 1996; Ward & Zurbruegg, 2002; Hwang & Gao, 2003; Li, Moshirian, Nguyen, & Wee, 2007; Mitra and Ghosh (2010); Liebenberg, Carson, & Dumm, 2012; and Sliwinski, Michalski, & Roszkiewicz, 2013). Even so, Fortune (1973) identifies that if a high income earning individual practices savings, the consequential wealth accumulated will decrease his aversion to risk in turn causing his need for life insurance to dwindle. Hong & Ríos-Rull's (2012) study finds an adverse effect of income on life insurance purchase of middle-income groups but a positive influence for higher-income groups. With propensity to save being low and cost of living being high, life insurance premiums might not be attractive options for the middle-class; but might provide attractive tax savings to the rich.

This brings us to the other stance - life insurance as a form of savings. Despite the lack of a unified theory, important conjectures emerge from the existing literature. Should life insurance be viewed as saving that competes with other forms of saving in the market, then an increase in household savings or accumulated private wealth should deflate the need for life insurance. True to form, Lewis (1989); Mossin (1968); Fischer (1973); and Li et al (2007) argue that acquisition of funds and private wealth instils higher level of risk tolerance and/or ends up substituting for life-insurance overtime. But since saving is a characteristic of high-income groups and accumulated funds represent the ability to pay premiums, more savings and increasing net worth can also stimulate demand for life insurance. Along these lines, Hau (2000), Beck & Webb (2002), and Heo, Grable, & Chatterjee (2013) find a positive impact of savings on purchase of life insurance. Taking a step further, Sen & Madheswaran's (2013) study on select Asian countries deduce life insurance density to be elastic to savings but penetration to be inelastic, connotating that these economies are not very responsive to changes in aggregate savings. Then again, the study's log transformation of the penetration variable which is already in percentage terms renders this inference on elasticity disputable.

Premiums paid are essentially savings which are set aside by the insurer and paid back at a much later stage in the event of death, retirement or disability. Ripoll (1981) observes that a typical insurer calculates the premiums on the basis of interest rates which is discounted from the investment made by the policy holder. As a result, a high interest rate in the economy ought to result in smaller premiums and hence, higher demand for life insurance. But since in practice, most life insurance plans come with pre-fixed premiums, a direct effect of interest rates may not materialise. Nevertheless, high market interest rates on competing and relatively more liquid assets like bank deposits and bonds may indirectly dampen demand for life insurance by encouraging investors to switch to alternate saving options. True to form, studies by Cargill and Troxel, 1979; Li et al., 2007; Sliwinski et al., 2013 and Sen and Madheswaran, 2013 find a negative effect of interest rate on consumption of life insurance.

Inflation is touted to act as a deterrent to life insurance in the same way as it is a deterrent to any long-term saving plan (Ripoll, 1981). Price hike reduces the real value of the policy cover, thus making life insurance plans less attractive. Likewise, rising prices inflate basic consumption expenditures which again limits the affordability of investment plans. Accordingly, Browne & Kim (1993), Outreville (1996), Ward and Zurbruegg (2002), Beck and Webb (2002), Hwang and Gao (2003), Li et al. (2007), Mitra and Ghosh (2010), Sen & Madheswaran (2013) etc evidence a negative effect of inflation and price instability on demand for life insurance.

Finally, by virtue of being a type of social security, demand for life insurance is also influenced by social and demographic factors. In particular, an earning individual's purchase of life insurance over annuities is basically a transaction made on behalf of her beneficiaries – dependent children. Individuals care about their dependent's long-term wellbeing, practice some level of altruism and have an operational bequest motive, as argued by Hakanson (1969) and Hong and Rull (2012). Studies by Beenstock (1968), Hammond et al (1967) and Lienberg et al (2012) thus find number of dependents to be a positive significator of life insurance demand. Browne and Kim (1993); Outreville, 1996 and Sen and Madheswaran (2013) lend further support that younger economies offer a larger market for life insurance businesses. Besides dependents, education has also been theorised to play a positive role in demand for life insurances along the notion that more years of formal education provide greater awareness of the need for life insurance and aids meticulous future financial planning Hammond, Houston and Melader, 1967; Burnett & Palmer, 1984; Truet and Truet, 1990; Outreville, 1996; Browne and Kim, 1993; Beck and Webb, 2002; Li et al., 2007 etc do find

education to stimulate life insurance purchase. Outreville (1996) estimates a negative impact of education on insurance demand but acknowledges that the negativity owes to strong multicollinearity between the demographic variables set used, namely, HDI, life expectancy, health status, dependency ratio and social security. Sliwinski et al's (2013) study deserves special mention for taking due cognizance of the bias that plagues most past studies for using a wide range of related economic and demographic variables as regressors. The study uses factor analysis to merge these variables into four independent factors and the subsequent regression reveals economic and financial factors to be the strongest stimulator of life insurance demand.

5.3 Research Gaps:

Few studies have empirically explored the demand for life insurance in India using long time-series data. Notwithstanding their pioneering contribution in explaining this demand, their contrasting findings hint at the sensitivity of their explanations to methodological nuances. For instance, the earliest time-series study on probable determinants of life insurance dates back to Sadhak (2006) who computes Pearson's correlation coefficients on the level of variables like personal disposable income, household savings and life insurance funds thereby generating spurious results with correlations reaching as high as 0.99. In order to assess the income effect on demand for life insurance under a causal framework, Mitra & Ghosh (2010), Ghosh (2013), Parida & Acharya (2014) and Mathew & Sivaraman (2017) model premium expenditures as a function of gross disposable income. But while the first three studies find a positive income effect on the edifice of spurious regressions that do not factor in short-term error corrections in estimation, the otherwise fine study of Mathew & Sivaraman (2017) concludes a negative income effect which is discernibly a consequence of the inevitable correlation between inflation and aggregate income. An inverse relation between income and life insurance penetration also emerges for the time-series study of Sen (2008) that considers GDP per capita, alongside gross domestic savings (GDS) per capita, as explanatory variables. If not collinearity, the inverse effect could be merely the result of the numerator in GDP per capita being the denominator in insurance penetration rate. Similar is the case for inflation and interest rates as explanatory variables. Inflation is touted to act as a deterrent to life insurance in the same way as it is a deterrent to any long-term saving plan (UNCTAD, 1981). However, inflation has a positive sign in the study by Mathews and Sivaraman (2017) and Mitra and Ghosh (2010) and real interest rate have the counter intuitive positive sign in Sen (2008) and these, we argue, can be attributed to the inclusion of both inflation and interest

rate as regressors. Inflation is also a positive predictor in the study by Ghosh (2013) who reasons it with the plausible existence of money illusion. But then again, there is no strong reason why such an illusion should be a characteristic of an emerging market economy like India. It is more likely that the sign owes to the correlation between inflation and GDP per capita. Last but not the least, almost all the studies employ the rudimentary ADF test to gauge the unit root properties of the variables but deduce the series on inflation i.e. the change in general price levels to possess a unit root.

It is in this backdrop that this current study finds space. Unlike in the case of unit level studies where findings are bound to be sample specific and contextual, ambiguity in single-country macro level studies is uncalled for and merits decisiveness in order to facilitate efficient policy decisions. In what follows, this chapter attempts to reconcile some of the methodological oversights in existing studies to definitively identify the prime determinants of absolute and per capita demand for life insurance in India. In particular, it departs from existing studies in terms of representation, factors out bias from collinearity and employs higher power statistical tests to better ascertain and model the time-series properties of the macroeconomic variables. More importantly, it adds to the literature by accounting for the asymmetric association between demand for life insurance and the ability to pay. In doing so, it empirically establishes the theorised duality of life insurance as an item of consumption and a type of saving.

5.4 Methodology

Our analysis is structured around a partial equilibrium model where we consider a country's demand for life insurance to be a function of her income, her households' savings, inflation, dependency ratio and attainment of higher formal education. The model is built on annual data spanning the period 1991-92 to 2021-22, thereby making our study fall within the ambit of time-series analysis. The exact econometric specification of the model is subject to the nature of data, variable construction and properties of time-series used.

5.4.1 Data and Variable Description

As mentioned, our dependent variable is the demand for life insurance. A country's overall demand for life insurance can be quantified either in terms of total amount insured or her total expenditure on life insure premiums (Hamond, Houston, Melander (1965); Duker, (1969)). In the absence of reliable data on the former, this study employs two distinct measures of

premium expenditures as approximations of India's demand for life insurance namely Life Insurance Density (D) and Life Insurance Penetration (P). By definition, insurance density is the ratio of a country's insurance premiums to its population. Penetration rate, on the other hand, expresses insurance premium expenditures as a percentage of gross domestic product (GDP). So, while density indicates the per capita demand for life insurance, the penetration rate serves as a signifier of the share of insurance demand in the country's aggregate demand. However, being a percentage, penetration is bounded between 0 and 100. Seeing as bounded dependent variables pose estimation issues in linear regression framework, we retract the absolute levels of premium expenditure from the percentage figures. The resulting series denotes the absolute level of life insurance premium expenditures. The raw data on density, which is available in USD terms for international comparisons, have been converted to rupee figures using the nominal exchange rate (₹ per USD) for consistency with the rest of the dataset.

With regard to the explanatory variables, we deviate from studies like Cargill and Troxel (1979); Sadhak (2006); Parida & Acharya (2014) etc that have considered personal disposable income over gross income per capita to estimate the income effect on demand for insurance. Taking disposable income inadvertently assumes taxes to have no bearing on life insurance demand when in fact, one of the key reasons behind their purchase is to avail tax concessions. In short, there is no *a priori* reason to assume that individuals do not take their taxes into account when buying life insurances. Accordingly, this study considers the conventional GDP per capita in current prices and in rupee terms as a measure of personal income. Household savings per capita have been computed using data on gross household savings, as obtained from the RBI Database along with the World Bank's population estimates. The series is denominated in rupees and taken in current 2011-12 prices. The country's inflation is captured in terms of annual changes in the Wholesale Price Index (WPI), data for which is sourced from the RBI and back series data have been rebased to 2011-12 prices. To cover the bequest motive behind purchase of life insurance, dependency ratio is used as an explanatory variable. It shows the proportion of young dependent population (<15 years) to the working-age population (15-64 years). The series has been sourced from the World Bank database. Finally, due to dearth of statistics on high level of educational attainment, we consider the enrolment in secondary education to gross enrolment as a proxy. One can argue that enrolment does not imply attainment and secondary school is not necessarily higher education. But then again, since enrolment is the first step to

attainment and secondary schooling is a pre-requisite to higher education, the proxy is fitting to the purpose of this study. Data on secondary education enrolment is also drawn from the World Bank. All the level variables – per capita income, savings per capita, density and absolute penetration have been taken in their natural log forms. Dependency rate, education and inflation continue to be expressed in shares and percentages. Table 5.2 summarises the variable construction and their data sources.

Table 5.2 Variable Description and Data Sources

<i>Variable Definition</i>		<i>Construction</i>	<i>Data -Sources Us</i>
lnD	Per Capita Demand for Life Insurance	Log of life insurance density, post conversion to rupee figures	Handbook of Indian Insurance, World Bank Official Exchange Rate (Rs per USD)
lnP	Absolute Demand for Life Insurance	Log of the product series of penetration and GDP	Handbook of Indian Insurance, World Bank GDP in current prices and Rupee Terms
lnY	Per Capita Income	Log of GDP Per Capita	World Bank Per Capita Income in current prices and Rupee Terms
lnS	Savings	Log of per capita household savings	RBI Database, World Bank's Population Estimates
$gWPI$	Inflation Rate	Annual growth rate of Wholesale Price Index (2011-12 base)	RBI Database
EDU	Higher Education	Secondary School Enrolment as a % of Gross Enrollment	World Bank Database
DR	Dependency Ratio	Ratio of young dependents to working-age population (%)	World Bank Database

Table 5.3 reports the descriptive statistics and distributions of the variables. The sample period reports an average inflation growth rate of a resounding 6 % per annum and a secondary school enrolment of 58%. The average dependency ratio is 51 % intimating an almost equi-proportionate distribution of young and working-age population for the period. The Jarque-Bera (Bera & Jarque, 1981) test statistics reject the null of non-Gaussian distribution for all the variables.

Table 5.3: Basic Descriptive Statistics of the Variables

	<i>lnD</i>	<i>lnP</i>	<i>lnY</i>	<i>lnS</i>	<i>gWPI</i>	<i>DR</i>	<i>EDU</i>
Mean	6.75	32.34	10.64	9.08	5.59	51.17	58.01
Maximum	8.59	34.4	12.16	10.39	12.99	64.29	78.81
Minimum	4.40	29.4	9.03	7.31	-3.65	37.32	36.60
Std. Dev.	1.38	1.5	0.95	0.92	3.53	8.50	12.81
Skewness	-0.40	-0.44	-0.02	-0.38	-0.06	-0.05	0.16
Kurtosis	1.72	1.82	1.69	1.92	3.34	1.73	1.56
				2.24			
Jarque-Bera	2.94 (0.2)	2.7 (0.2)	2.18 (0.3)	(0.3)	0.17 (0.9)	2.09 (0.3)	2.79 (0.2)
<i>n</i>	31	31	31	31	31	31	31

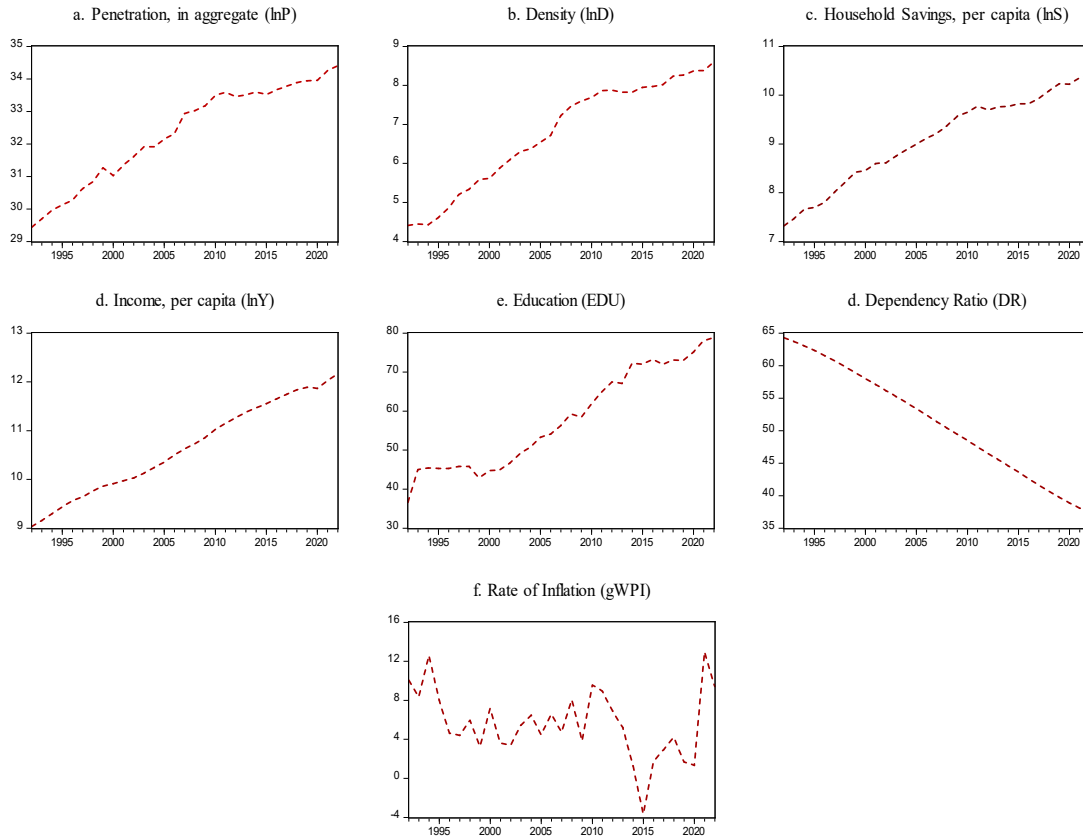
Figure in parenthesis () show exact probabilities of the Jarque-Bera statistics on the null of normal distributions

5.4.2. Stationarity and Unit Root Tests

With data spanning a period of 31 years, the foundation of our analytical framework nests on the long-run properties of the time-series used. If autoregressive representations of the variables at levels indicate stationarity, any liaisons between them will be short-lived and we can test them within the classical regression context, without the danger of spurious judgements (Granger & Newbold, 1974). Conversely, if the series exhibit considerable persistence with unit roots, the prospect of a long-run equilibrium relationship between them cannot be overruled. Indeed, given that the decision to get life insurance is conditional on the effect that the insured's death can have on the future consumption of other household

members, we argue that the existence of a levels or long-run association between demand for life insurance and its causal factors merits due attention.

Fig.5.1. Time Plots of the Variables, 1991-92 to 2021-22



As per the time-paths of the variables plotted in Figure 5.1, the series on inflation rate ($gWPI$) appears to be mean-reverting or levels stationary, as expected. Life insurance density ($\ln D$), aggregate premium expenditure ($\ln P$), per capita income ($\ln Y$), per capita savings ($\ln S$) and education (EDU) exhibit strong upward trending behaviour along the course of the sample period. Dependency ratio (DR), on the other hand shows a downward trend, clearly a result of the country's achievements in population control and family planning. We employ formal unit roots and stationarity tests to better delineate whether these trends are deterministic or stochastic. In precise, our variables are subjected to (i) the DF-GLS test by Elliott, Rothenberg & Stock (1996) which is built on the null of unit roots, (ii) Lee & Strazicich (2003) test built of the null of unit roots with breaks and (iii) the KPSS test on the null of stationarity by Kwiatkowski, et al. (1992).

The choice of DF-GLS over the classic ADF test of unit root accrues from the fact that the former has nearly the same power to the ADF test under the assumption of no deterministics in the underlying series, but is far superior to ADF when the series has any deterministic trends or drifts (non-zero means). And as per the time-plots in Figure 5.1, the presence of deterministics in our series of choice is fathomable. But although DF-GLS improves on the low power of ADF test due to misperceived trends and means, it has low power in the presence of structural breaks. Since our period of study stretches across some dramatic macro-economic events in the national and international milieu, the presence of breaks in the variables cannot be undermined. What this implies is that our DF-GLS test runs the risk of wrongly inferring an otherwise stationary process with structural breaks to be a unit root process. As such, we additionally undertake the Lee & Strazicich (2003) test of unit root which tests the null of a difference stationary process with structural breaks against a trend stationary process with structural breaks. Variables are further treated to the Kwiatkowski, Phillips, Schmidt, & Shin (1992) test of stationarity. This is done under the contention that testing the null of unit root often has low power when compared to testing the alternative null of stationarity. LM statistics for the KPSS test are constructed on the nulls of trend stationarity and level stationarity against the alternative of difference stationarity, such that rejection of the null points to the presence of unit roots.

All the three tests are performed on both the level series and on first differences, in case of unit root detection. Results of the same are presented in Table 5.4

Table 5.4: Testing for Stationarity and Unit Roots

<i>Variables</i> ↓	<i>DF-GLS^a</i>	<i>KPSS^b</i>	<i>Lee-Strazicich^c</i>	
	<i>H₀</i>: unit root	<i>H₀</i>: stationary	<i>H₀</i>: unit root despite break(s)	Inference
	<i>(Model: Intercept with linear trend)</i>			
<i>lnD</i>	-0.83	0.15**	-2.94	I(1)
$\Delta \ln D$	-4.17***	0.09		
<i>lnP</i>	-1.36	0.13**	-3.92	I(1)
$\Delta \ln P$	-5.70***	0.08		
<i>lnY</i>	-2.39	0.07	-4.28***	I(0)
$\Delta \ln Y$	-3.68**			

$\ln S$	-1.23	0.16**	-1.94	I(1)
$\Delta \ln S$	-5.44***	0.09		
$gWPI$	-3.37**	0.10	-5.41***	I(0)
DR	-1.01	0.14**	-3.08	I(1)
ΔDR	-3.42**	0.06		
EDU	-2.06	0.10	-3.97	I(1)
ΔEDU	-4.95***			

^aUsing Mc-Kinnon finite sample critical values. ^bBased on Quadratic Spectral kernel and Automatic bandwidth selection procedure of Newey-West. ^cFor SIC based lags for a maximum of 2 lags. *, **, and *** denote significance at 10%, 5% and 1% respectively

True to form, all three tests unanimously identify $\ln D$, $\ln P$, $\ln S$ and DR as $I(1)$ processes and the series $gWPI$ as an $I(0)$ series. The KPSS and Lee Strazicich test jointly infers $\ln Y$ to be an $I(0)$ process with a deterministic trend; while DF-GLS and the Lee-Strazicich test infers EDU to be an $I(1)$ process. In a nutshell, our explanatory variable set comprises of both $I(0)$ and $I(1)$ processes while the dependent variables of choice are exclusively $I(1)$.

5.4.3 Correlation Matrix

Having identified the statistical and time-series properties of our variable set, we next probe into the plausible presence of multicollinearity to skirt biased estimates. Collinearity between two trending time-series cannot be outrightly adjudged from their correlation coefficients, for the latter would be spurious and deceptively high (Vigen, 2015). The same reason renders post estimation computation of VIFs and tolerances of our variables invalid. Consequently, for our variable set, we compute correlations between the trend stationary form of the $I(0)$ series $\ln Y$ and the first differenced forms of all the $I(1)$ series; as they all exhibit visible trends. The detrended $\ln Y$ series is obtained after procuring its trend (t) using the decomposition technique of Beveridge & Nelson (1981). We present the subsequent Pearson's correlation coefficients between the variables in Table 5.5.

Table 5.5: The Correlation Matrix of Variables

	$\Delta \ln D$	$\Delta \ln P$	$\ln Y - t$	$\Delta \ln S$	$gWPI$	ΔEDU	ΔDR
$\Delta \ln D$	1						
$\Delta \ln P$	0.64	1					
$\ln Y - t$	0.07	-0.30	1				
$\Delta \ln S$	0.41	0.46	-0.21	1			
$gWPI$	0.01	0.06	0.66	0.10	1		
ΔEDU	-0.11	-0.07	0.10	-0.37	0.31	1	
ΔDR	0.14	0.09	-0.14	0.02	0.36	-0.19	1

As predictable, the two dependent variables of choice – life insurance density ($\ln D$) and absolute penetration ($\ln P$) are highly and positively correlated with a coefficient of 0.64. Amongst the explanatory variable set, the series on inflation rates ($gWPI$) and per capita income ($\ln Y$) share a high correlation of 0.66, thus intimating that the two are collinear. We shall take this into consideration in our model-building.

Sign-wise, growth rate of household savings per capita ($\ln S$) appears to be negatively associated with growth of income per capita, which could be the consequence of higher propensity to consume in the country. The magnitude of association between the two at -0.21 is not very high, but credibly explains the negative *albeit* low association between income and life insurance penetration ($\ln P$). If saved funds denote ability to pay premiums, then a country with low savings rate will exhibit an inverse relation between incremental income and purchase of life insurances. Again, the negative association between EDU variable on one side and $\ln S$, $\ln D$ and $\ln P$ on the other side serves as a reminder that higher education in India is a costly affair that constraints household's savings. Correspondingly, education costs form a part of child-rearing cost which explicates the negative correlation coefficient of -0.19 between EDU and DR . More the number of children, greater their educational expenses and lesser their enrolment in higher levels of schooling. This association could also work the other way round – educated people, by virtue of being more aware of family planning and the cost of rearing children, may settle for smaller families and thus, contribute to a contraction in the total number of young dependents in the country.

We do not find any strong association ($> |0.5|$) between our dependent variables ($\ln D$ or $\ln P$) and the explanatory variables of choice per se. But since correlation fall short of projecting causality and/or demarcating between long-run and short-run dynamics between trending variables, we proceed for a causal analysis befitting to the purpose of our study.

5.4.4 Model and Estimation

We model the demand for life insurance using single-equation estimation techniques befitting for $I(1)$ dependent variable and a mix of $I(0)$ and $I(1)$ explanatory variables. In precise, we employ the ARDL bound testing approach of Pesaran, Shin, & Smith (2001) for it can identify the presence of long-run relationship between a variable and a set of regressors, “irrespective of whether the underlying regressors are $I(0)$, $I(1)$ or mutually cointegrated”, and also simultaneously provide the short-run estimates. The ARDL procedure involves building a ‘conditional’ reduced-form short-term error-correction model (ECM) where the causality is assumed to be unidirectional, such that the parameters are corrected for weak endogeneity. It is on this ECM that F test statistics are constructed on the nulls of no levels relationship, and then tested against a set of two critical values that serve as ‘bounds’ each for purely $I(0)$ and purely $I(1)$ processes, such that if the values of the statistics cross the critical $I(1)$ bound, then the null stands rejected.

For our purpose, we first model demand for life insurance as linear functions of their p lagged AR terms and q lagged explanatory variables. Per capita income ($\ln Y$), as an explanatory variable, is dropped owing to its collinearity with the country’s inflation rate ($gWPI$). Nonetheless, since savings is a function of income and a high propensity to save is characteristic of higher income, the savings per capita variable ($\ln S$) is expected to also cover for the income effect.¹ Thus, our ultimate models hypothesize life insurance density ($\ln D$) and absolute penetration ($\ln P$) as functions of two economic and two demographic variables, namely, savings per capita ($\ln S$), rate of inflation ($gWPI$), higher education (EDU) and young dependency ratio (DR). The order of the lags (p, q) is determined using Schwarz Information Criteria (SIC), with a maximum lag length of (1, 2) keeping in mind the shorter time-frame of the study with only 31 observations.

The parsimonious ARDL models, as chosen by SIC, for life insurance density ($\ln D$) and absolute penetration ($\ln P$) can be written as -

¹ A similar approach has been taken by Sen (2008) who argues that as income grows, it will add to insurance demand only via the rising savings component.

(Model 1.1)

$$\ln D_t = \alpha + \phi \cdot \ln D_{t-1} + \beta_1 \cdot \ln S_t + \beta_2 \cdot gWPI + \beta_3 \cdot DR + \beta_4 \cdot EDU + v_t$$

And,

(Model 2.1)

$$\ln P_t = \alpha + \phi \cdot P_{t-1} + \beta_1 \cdot \ln S_t + \beta_2 \cdot gWPI + \beta_3 \cdot DR + \beta_4 \cdot EDU + v_t$$

where, α is the intercept, ϕ is the coefficient to the AR term, β_i shows the marginal effect of the i^{th} explanatory variable and v_t represents deviations from equilibrium in time t .

According to Pesaran, Shin, & Smith, (2001), the dynamic form of ARDL model conceives consistent OLS estimates of short-run parameters that converges at the standard rate of $\sqrt{T}$ and so are asymptotically normal, while long-run estimates are T consistent and have mixed normal distributions. It is on the estimated conditional ECMs underlying Models 1.1 and 2.1., that the F -bounds statistic on the dual null hypotheses of (i) joint significance of the long-run coefficients and (ii) significance of the equilibrium adjustment parameter (v_{t-1}) are tested.

Now, implicit in Model 1.1 and 2.1 is the idea that demand for life insurance have a symmetric response to changes in the explanatory variables across all time-periods, irrespective of whether the t entails a positive change in the variable or a negative change. This assumption is restrictive when it comes to the impact of income or savings on demand for life insurance because it rules out the possibility of ratchet and demonstration effects. It is also palpable that the economy responds strongly to an increase in savings than to a decrease, as the process of discontinuing or surrendering purchased life insurances entails costs on the insured. Furthermore, how an agent responds to an incremental income or savings can vary in terms of the nature of response too, for incremental savings are not just increased avenues to pay out premiums, but also increased wealth which can substitute for the market insurance altogether.

Given these qualifications and possibilities, we lend Models 1.1 and 2.1. asymmetric constructions in which the variable $\ln S_t$ is decomposed into its partial sum processes of positive and negative changes, thereby, begetting a non-linear ARDL (NARDL) model of the forms –

(Model 1.2)

$$\ln D_t = \alpha + \phi \cdot \ln D_{t-1} + \theta^+ \cdot \ln S_t^+ + \theta^- \cdot \ln S_t^- + \beta_2 \cdot gWPI + \beta_3 \cdot DR + \beta_4 \cdot EDU + v_t$$

and,

(Model 2.2)

$$\ln P_t = \alpha + \phi \cdot P_{t-1} + \theta^+ \cdot \ln S_t^+ + \theta^- \cdot \ln S_t^- + \beta_2 \cdot gWPI + \beta_3 \cdot DR + \beta_4 \cdot EDU + v_t$$

where,

$$\begin{cases} \ln S_t^+ = \sum_{j=1}^t \Delta \ln S_t^+ = \sum_{j=1}^t \max(\Delta \ln S_t, 0) \\ \ln S_t^- = \sum_{j=1}^t \Delta \ln S_t^- = \sum_{j=1}^t \min(\Delta \ln S_t, 0) \end{cases}$$

The long-run models 1.2 and 2.2 now employ two different filters allowing insurance demand to respond differently to positive growth and negative growth in savings per capita. If indeed this response differs rightly such that $\theta^+ \neq \theta^-$, and if $v_t \sim I(0)$, then it is implied that savings is asymmetrically cointegrated with demand for life insurance.² To test the dual null hypotheses of no asymmetry ($\theta^+ = \theta^-$) and no cointegration ($v_t \sim I(1)$), we employ the NARDL F -bounds statistic of Shin, Yu, & Greenwood-Nimmo (2014) which is basically a nonlinear extension of the ARDL bound tests.

Furthermore, the NARDL model can generate information about the cumulative dynamic multiplier effects of $\ln S_{t-1}^+$ and $\ln S_{t-1}^-$ on $\ln D_t$ (or $\ln P_t$) over some forecast time horizon, say h such that they show how the dependent variable responds and adjusts to a positive or negative unitary shock in savings per capita, over the horizon. In the event of significant long-run relationship, the cumulative dynamic multipliers are extracted as,

$$mh^+ = \sum_{i=0}^h \frac{\partial \ln D_{t+i}}{\partial \ln S_{t-1}^+} \quad \text{and} \quad mh^- = \sum_{i=0}^h \frac{\partial \ln D_{t+i}}{\partial \ln S_{t-1}^-}$$

for the density model or,

² Since our dependent variables ($\ln D$ and $\ln P$) and the key asymmetric explanatory variable ($\ln S$) are all $I(1)$ processes, the PSS' F test for long-run level relationship translates into a test for cointegrating relationship. (Pesaran, Shin and Smith, 2001)

$$mh^+ = \sum_{i=0}^h \frac{\partial \ln P_{t+i}}{\partial \ln S_{t-1}^+} \quad \text{and} \quad mh^- = \sum_{i=0}^h \frac{\partial \ln P_{t+i}}{\partial \ln S_{t-1}^-}$$

for the penetration model, where mh^+ and mh^- capture the dynamic response of the system to a positive shock and a negative shock in savings per capita, respectively. The statistical significance of the impulse response asymmetry can be judged by mapping whether the difference between the two cumulative dynamic multipliers mh^+ and mh^- is significantly different from zero for 95% confidence intervals.

The post estimation diagnostic tests that have been followed up include –normality tests of Bai & Serena (2005), Breusch-Pagan serial correlation test and heteroskedasticity tests of Breusch-Pagan-Godfrey. Stability of the models are judged from the CUSUM and CUSUM-SQ tests of Brown, Durbin, & Evans (1975) which plots the cumulative sums and cumulative sum of squares of the recursive residuals against 95 % confidence bands for assessing the stability of the model parameters and residual variances, respectively.

5.5 Results and Discussion

5.5.1 Determinants of Life Insurance Density

Table 5.6 presents the results of the ARDL and NARDL Bounds tests built on the conditional ECMs of the models for life insurance density ($\ln D$).

Table 5.6: Bound Testing for Long-Run Relation in Density Model

Model 1.1. (ARDL)		Model 2.1. (NARDL)		
Statistic	Estimate	Estimate		
^a	e Critical Bounds	e Critical Bounds		
	Significance I (0) I (1)	Significance I (0) I (1)		
F_{PSS}	10% 2.2 3.09	10% 2.08 3.0		
	12.4*** 5% 2.56 3.49	16.9*** 5% 2.39 3.38		
	1% 3.29 4.37	1% 2.7 3.7		
	10% 2.45 3.46	10% 2.4 3.5		

$F_{NG,n=30}$	12.4***	5%	2.97	4.08	16.9***	5%	2.8	4.0
		1%	4.09	5.53		1%	4.1	5.7

^a Models have a maximum of 2 lags and restricts the intercept to enter the level equation.

Source: Author

As reported, the asymptotic critical bounds for the computed F -statistics on the ARDL model resoundingly rejects the null of no levels relationship at 1 % level of significance, and this is confirmed further by the finite sample critical values of Narayan (2005). Thus, the variables $\ln D$, $\ln S$, EDU , DR and $gWPI$ share a long-run equilibrium relationship where the causality runs from the latter four to $\ln D$. More importantly, the NARDL F -bounds statistics also asserts the presence of a levels relationship while also rejecting the null of no significant asymmetrical effect of savings on life insurance density ($\theta^+ = \theta^-$), at 1% level of significance. To this end, it can thus be inferred that per capita savings and life insurance density are asymmetrically cointegrated.

Table 5.7 Estimates of the Life Insurance Density Model

ARDL Model (1.1)			NARDL Model (2.1)	
Variable	Coefficient	Std. Error	Coefficient	Std. Error
c	-18.5***	4.75	6.76**	2.97
$gWPI$	-0.01**	0.008	-0.03***	0.007
DR	0.10**	0.04	-0.05	0.04
EDU	0.02**	0.01	0.03***	0.009
$\ln S$	2.10***	0.23		
$\ln S_t^+$			0.84***	0.29
$\ln S_t^-$			13.44***	2.98
Short-Run Estimates				
Variable	Coefficient	Std. Error	Coefficient	Std. Error
c	-9.3**	4.44	4.09	2.61
v_{t-1}	-0.50***	0.16	-0.60***	0.18
$gWPI$	-0.009	0.005	-0.01**	0.006
ΔDR	0.05	0.03	-0.034	0.038
ΔEDU	0.01	0.01	0.02*	0.01
$\Delta \ln S$	1.06***	0.36		
$\Delta \ln S_t^+$			0.51	0.40
$\Delta \ln S_t^-$			8.14**	2.27

$\Delta \ln S_{t-1}^-$		-2.89	1.81
Diagnostics Tests			
R^2	0.49	0.66	
$\overline{R^2}$	0.49	0.64	
χ_{AC}^2	1.07 (0.35)	2.53 (0.18)	
χ_{HET}^2	0.23 (0.94)	1.28 (0.30)	
χ_{BNG}^2	1.56 (0.45)	1.31 (0.51)	
F_{FF}	0.94 (0.34)	1.07 (0.36)	

1. $\overline{R^2}$ is the adjusted R-squared of the conditional ECM
2. χ_{SC}^2 , χ_{HET}^2 and F_{FF} are test statistics for nulls of no serial correlation, no homoskedasticity and no functional form misspecification.

That the variables in question share a long-run equilibrium relationship implies that their short-run dynamics is characterised by adjustments to this equilibrium. The t -bounds statistics on the coefficients of the error-correction term (v_{t-1}), as reported in Table 5. 7, also reject the null of no levels relationship for both the symmetric and asymmetric models. The speed of adjustment is found to be -0.5 for the ARDL model and -0.6 for the NARDL version. Between the two, the NARDL model offers a stronger joint explanatory power with an adjusted R^2 of 64%. The strong significance of the NARDL bounds statistic and the better fit of its ECM resounds that the long-run relation between India's per capita savings and life insurance density, *ceteris paribus*, is best defined as asymmetric wherein over the long-run, density responds differently to an increase in savings than to a decrease. Results of both models are robust to the various diagnostic tests mentioned in the bottom panel of Table 5.7. Recursive estimations of this underlying ECMs suggests that the estimated parameters are stable over the sample period, and the CUSUM and CUSUM square plots of this residuals do not show any significant breaks in the model for 5 % level of significance (Appendix II).

The overall inference from the estimates can be surmised as follows -

Per capita demand for life insurance (lnD) in India is elastic to availability of funds or household savings, but this elasticity is asymmetric both in terms of magnitude and in terms of direction. In essence, density tends to rise by 0.8 % to a per cent increase in savings in the long-run, but rises manifold (13 %) to a per cent decrease in savings. Simply put, the country's per capita demand for life insurance is positively inelastic to a rise in savings, but negatively elastic to a decrease in savings. This connotes that accumulated savings serves

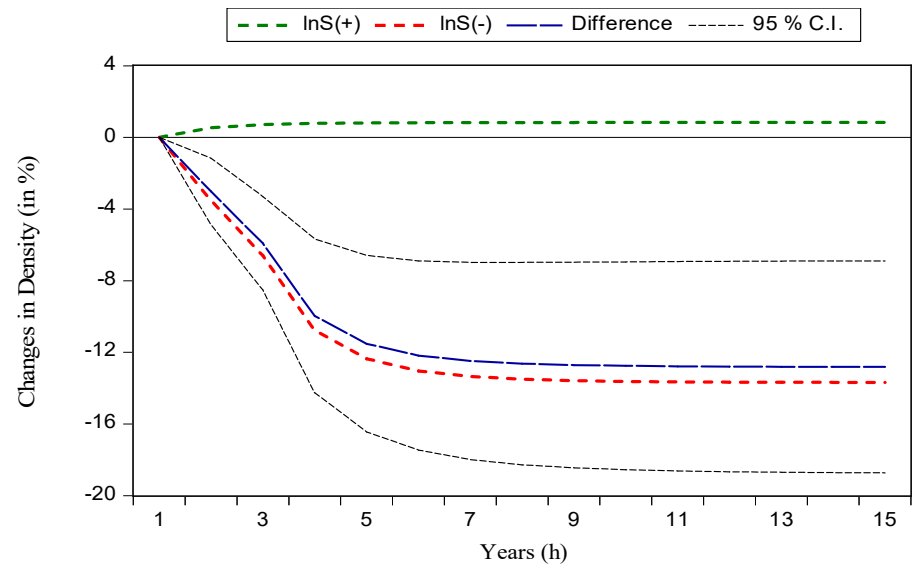
more as an end than as a means to financial or social security. Basically, Indian households do not just view their accumulated savings as the means to finance life insurance investments but also as wealth that can altogether substitute for social and financial security alternatives, so much so that a dip in this wealth risks their security, thus pushing them to go for life insurance. The long-run coefficients for inflation rate and higher education are -0.03 and +0.03, respectively. They both have expected signs. It is implied that soaring commodity prices require shelling out more funds/income on basic consumption expenses, such that less of it is available for investing in insurance. Also, to the extent that there exists no money illusion, structurally increasing inflation rates implies devaluation of the future insurance pay-back or benefits, thus making life insurance less lucrative for buyers. Accordingly, a percent increase in the country's rate of inflation causes per capita demand for life insurance to dip by -2.95%.³ Other things being equal, higher education generates greater awareness about the risk and the need to hedge against lost family income overtime. The more educated the population, greater the demand for life insurance. Elasticity wise, a per cent increase in enrolment to higher education causes a 3.04% increase in life insurance density in the long-run.⁴ Similar inferences can be drawn from the short-run estimates except that although per capita demand for life insurance is reactive to an instantaneous decrease in per capita savings, it does not significantly respond to a contemporaneous increase, essentially conveying that the positive influence of wealth (or savings) on demand for life insurance is a long-run phenomenon. In other words, per capita life insurance expenditure is more a function of permanent wealth rather than current wealth holdings.

Now although the coefficient of the error correction term v_{t-1} in the NARDL suggests that around 50% of the disequilibria is adjusted every year, there are significant asymmetries in this adjustment too as given by the cumulative dynamic multiplier graphs in Figure 5.2. *First*, the multiplier for positive changes in savings $lnS(+)$ is positive but so is the multiplier for negative changes in savings $lnS(-)$, throughout the fifteen-year forecast horizon reaffirming that while an increase in savings causes demand for life insurance to increase, a fall in savings also cause demand to increase. *Second*, equilibrium adjustments are significantly asymmetric for the 95% confidence bands for the difference graph between the two multipliers (blue-line) do not cover the value zero for any h , meaning that the difference is statistically different from zero. *Finally*, the multiplier graphs show that negative shocks to

^{3,5} Log-level interpretation of coefficients i.e. $\{exp(\beta) - 1\} \times 100$

savings (red-line) are more domineering and long-lasting and it is not until the fifth year that the shock is absorbed and a new equilibrium is achieved. Adjustment of density to positive shock in savings (green-line) is relatively faster.

Figure 5.2: Asymmetric Dynamic Cumulative Multipliers ($\ln S \rightarrow \ln D$)



5.5.2 Determinants of Life Insurance Penetration

Results for the life insurance penetration model offer similar inference. As reported in Table 5.8, both the ARDL and NARDL bound tests for long-run relationship between $\ln P$, $gWPI$, $\ln S$, EDU and DR yields F -statistics of values 13 and 12, respectively, which when compared to asymptotic and finite sample critical values, reject the null of no levels relationship at 1% levels of significance. The NARDL F -statistics further rejects the null of no asymmetries thus intimating, once again, that demand for insurance is asymmetrically cointegrated to per capita savings, other things being equal.

Table 5.8: Bound Testing for Long-Run Relation in Penetration Model

Model 1.1. (ARDL)		Model 2.1. (NARDL)		
Statistic	Estimate	Estimate		
^a	e	e		
	Critical Bounds	Critical Bounds		
	Significance	Significance	I (0)	I (1)
	I (0)	I (0)	I (1)	I (1)

F_{PSS}	13.01***	10%	2.2	3.09	12***	10%	2.08	3.0
		5%	2.56	3.49		5%	2.39	3.38
		1%	3.29	4.37		1%	2.7	3.7
$F_{NG,n=30}$	13.0 ** *	10%	2.45	3.46	12***	10%	2.4	3.5
		5%	2.97	4.08		5%	2.8	4.0
		1%	4.09	5.53		1%	4.1	5.7

^a Models have a maximum of 2 lags and restricts the intercept to enter the level equation.

The underlying conditional ECMs can hence be tested and long-run estimates can be drawn. Table 5.9 reports the model estimates for both the ARDL and NARDL specifications. As enclosed in the bottom panel of table 5.9, the validity of the model estimates is corroborated by the diagnostics tests. Proceeding to the coefficient estimates, the error correction terms are statistically significant and have a value of around -0.8, implying that adjustments of disequilibrium in aggregate demand for insurance is relatively fast than in the case of per capita demand.

Table 5.9. Estimates of the Life Insurance Penetration Model

ARDL Model (1.1)			NARDL Model (2.1)	
Long-Run Estimates				
<i>Variable</i>	<i>Coefficient²</i>	<i>Std. Error</i>	<i>Coefficient</i>	<i>Std. Error</i>
<i>c</i>	4.20	3.66	22.7***	2.44
<i>gWPI</i>	-0.003	0.005	-0.007	0.007
<i>DR</i>	0.11***	0.03	0.07**	0.02
<i>EDU</i>	0.03***	0.01	0.03***	0.01
<i>lnS</i>	2.24***	0.16	2.64***	0.54
<i>lnS_t⁺</i>			1.96***	0.20
<i>lnS_t⁻</i>			5.53**	2.05
Short-Run Estimates				
<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>Coefficient</i>	<i>Std. Error</i>
<i>c</i>	3.53	3.58	18.2***	4.08
<i>v_{t-1}</i>	-0.84***	0.18	-0.80***	0.18
<i>gWPI</i>	-0.002	0.007	-0.005	0.41
<i>ΔDR</i>	0.09**	0.03	0.064	0.44

ΔEDU	0.02*	0.01	0.03**	0.01
$\Delta \ln S$	1.88***	0.45		
$\Delta \ln S_t^+$			1.57***	0.49
$\Delta \ln S_t^-$			4.43**	1.75
Diagnostics Tests				
R^2	0.53		0.57	
$\overline{R^2}$	0.53		0.57	
χ_{AC}^2	1.32(0.28)		2.3 (0.11)	
χ_{HET}^2	0.56 (0.72)		0.76 (0.60)	
χ_{BNG}^2	1.56 (0.45)		0.64 (0.71)	
F_{FF}	1.57 (0.12)		1.57 (0.12)	

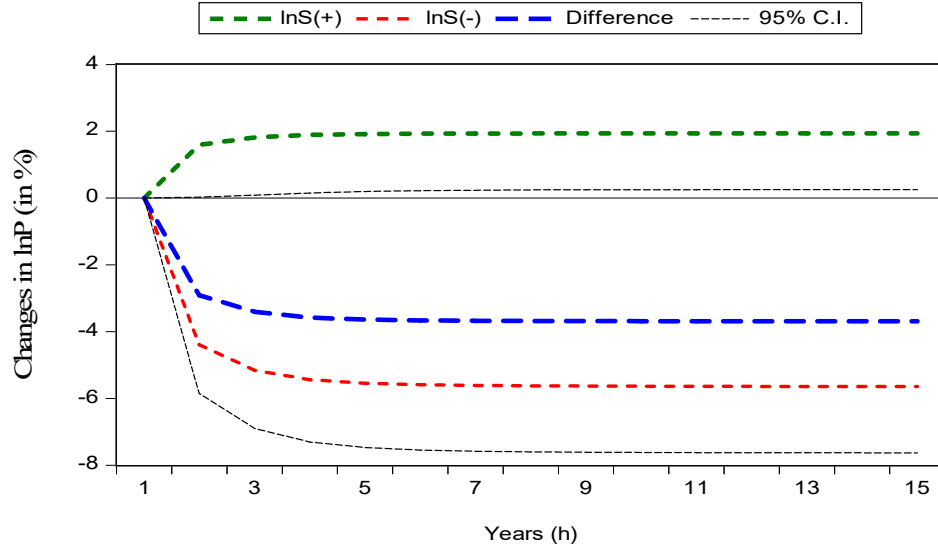
1. $\overline{R^2}$ is the adjusted R-squared of the conditional ECM
2. χ_{SC}^2 , χ_{HET}^2 and F_{FF} are test statistics for nulls of no serial correlation, no homoskedasticity and no functional form misspecification.

BNG

Economic intuition secured from the rest of estimates go as follows –

The country's household savings per capita ($\ln S$) have an asymmetric effect on her aggregate demand for life insurance ($\ln P$). Demand responds strongly and inversely to a fall in savings per capita (5.56 %), and positively to an increase in savings (1.96 %), thereby reaffirming our conjecture that saved funds do not just raise the ability to pay premiums but acts more fervently as wealth capital and self-insurance, thus, eroding the need for market life insurance. The coefficient on EDU variable reestablishes that demand for insurance is elastic to higher education, ceteris paribus. A percent rise in secondary education enrolment raises the economy's aggregate expenditure on life insurance premiums by 3.04%. Aggregate premium expenditure does not seem to be significantly affected by inflation rate (gWPI) for the sample period, albeit having the correct negative sign. Markedly, increasing number of young dependents (DR) in the country swells consumption of life insurance conveying that the bequest motive behind life insurance purchase stands. Perhaps, the insignificance of dependents in the density model is due to the per capita construction of the density variable wherein the effect of increasing number of young children on premium expenses is offset by its impact on population size.

Figure 5.3: Asymmetric Dynamic Cumulative Multipliers ($\ln S \rightarrow \ln P$)



The narrative secured from the dynamic cumulative multiplier graphs from the penetration model is consistent with that of the density model. As Figure 5.3 illustrates, both a positive shock as well as a negative shock to savings bring forth a positive change in aggregate demand for life insurance, with the effect of the latter being stronger and lasting longer. The difference in multiplier is not statistically different from zero as per the interval plots, but we believe it holds significant for 90% intervals considering the small margin for which the significance stands rejected by the 95% bands.

In closing, between the model on life insurance demand per capita ($\ln D$) and demand in aggregate ($\ln P$), the former offers better fit and stability. The stability diagnostics of the NARDL model for $\ln P$ (Appendix III) hints at the presence of intercept-type structural breaks for the sample period. Since stability is imperative to make valid inference, we round off with the conclusions from the model on life insurance density. That is, per capita demand for life insurance in India is a negative function of inflation rate, a positive function of higher education and an asymmetric function of household savings per capita or the ability to pay for life insurance.

5.6 Conclusion

This study looks at select macroeconomic and demographic influences on India's demand for life insurance for the period 1991-92 to 2021-22. The time-series analysis that ensue identify significant long-run relationships underlying both the per capita demand and absolute demand for life insurance, and the behavioural elasticities procured reveal interesting findings. Among other things, results show that demand for life insurance is positively inelastic to a rise in per capita savings, but negatively elastic to a decrease in these savings. Indian households do view their saved funds as the means to pay premiums, but they also view accumulated savings as wealth that can altogether substitute for social and financial security alternatives, so much so that a dip in this wealth risks their security and drives them to get life insurance. Our finding that life insurance consumption rises more fervently when personal savings contract also suggests that demand for life insurance is not as much a function of income as it is a function of risk aversion. Future research scope lies in delineating the wealth or income effect from the implied risk aversion effect on insurance demand.

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Chapter 6

Summary and Concluding Remarks

6.1. Introduction:

The insurance industry has taken on significant importance in developing nations because it has the ability to accelerate economic growth. The insurance sector aids in the growth of an economy in a number of ways, including managing risk, mobilizing savings, serving as a financial intermediary, encouraging investment activity, stabilizing the financial market, and effectively allocating capital resources.

"The Life Insurance Industry has been analysed by dividing the entire period of the insurance business into three parts: the Pre-nationalization period (1912-1955), Nationalization and Post-Nationalization (1956-1999), and the post-reformation period (2000-2021)'".

In 1993, in an attempt to breathe new life into the insurance sector, the government formed a powerful committee led by Mr. R.N. Malhotra. The committee's goal was to support reforms that were intended to make the financial system more competitive and efficient while also meeting the needs of the economy.

The Indian Economic reforms implemented in 1991 made a remarkable impact on the Indian insurance industry. India opened up the insurance market on two fronts: foreign businesses were allowed to join the insurance industry with a first share, and domestic private-sector enterprises were allowed to enter the life insurance business.

By allowing private players in the insurance sector, the monopoly LIC lost its influence, and its share in the insurance sector had to be limited to 64.14% by 2020-21.

The growth of the Indian economy was significantly aided by LIC and private life insurers, according to performance analysis that takes into account parameters like insurance penetration and density, total life insurance premium income, market share, the investment made by the life insurance industry, total expenses, profit or loss, and so on.

As per a comprehensive analysis conducted by Swiss Re Sigma, the global insurance penetration and density for the life segment in 2021 stood at 3.0 percent and USD 382, respectively. India experienced a rise in insurance penetration of from 2.82% in 2019–20 to 3.20% in 2020–21. Worldwide economic swings resulted in a drop in insurance penetration during the period 2009-10 to 2014-15. However, insurance penetration increased again starting in 2015–16.

The insurance density in India, recorded at \$59 during the 2020-21 period, remained consistent with the previous year. The insurance density has demonstrated a continuous upward trajectory, surging from USD 9.1 in 2001-02 to USD 55.7 in the fiscal year 2010-11. Following intermittent fluctuations, there has been a sustained upward trend in insurance density since the fiscal year 2016-17.

The primary motivation behind this Study is to investigate the factors influencing the demand for life insurance in India. Previous statements on trends in life insurance penetration, density, market share, premiums, etc., highlight that many households in India do not have life insurance. Surveys and literature indicate that economic, demographic, and institutional factors play a crucial role in influencing households to either opt for or abstain from life insurance. These factors also contribute significantly to the substantial disparities in life insurance consumption observed among different states in India.

The thesis set three major objectives to examine issues revolving around Life Insurance demand in India.

1. To trace the development of Life Insurance Market in India since 1950
2. To trace factors that influence decision making the purchase of life insurance with particular reference to the coastal districts of Andhra Pradesh.
3. To Identify the demand side influence on life insurance Consumption in India.

The study is based on the data drawn from the secondary sources, as well primary survey. Appropriate methodological tools have been employed to arrive at conclusions. Each objective's data and methodology are covered in detail in the corresponding chapter.

6.2. Objectives wise summary and concluding remarks:

6.2.1. On the Evolution of Life Insurance Market in India

This chapter charts the development of India's life insurance market following nationalization. The market has not grown exceptionally even with the sector's privatization, foreign investment liberalization, launch of new products, and provider expansion. Interestingly, life insurance penetration—that is, the economy's share of life insurance premium spending relative to total demand spending—has been on the decline since the mid-2000s after a steady upward trend prior. As of right now, penetration is 3.2% of GDP. In conclusion, it is important to address demand-side obstacles in the life insurance sector in India. It is critical to comprehend the factors influencing the economy's need for life insurance in order to halt the decrease and establish a thriving market environment. The remainder of the thesis focuses on achieving this.

6.2.2. On Life Insurance Choice: Proximate Determinants

Every man is subject to the uncertainty of death, and his household to the risk of potential loss of income from his death. The decision to purchase life insurance involves a rational man's evaluation of the future financial needs and consumption requirements of the family in the event of his untimely demise. He buys a life insurance policy to hedge the risk of leaving his children and dependents deprived of the current standard of living. (Yaari, 1965; Hakanson, 1969; Fischer, 1973 and Richard, 1975). While there is no arguing that men naturally care about their dependents and worry about their future security, we do not however see a flourishing market for life insurance in India, more so in the state of Andhra Pradesh. Between 2015-2022, bifurcated Andhra Pradesh has witnessed a mere 0.05 % growth in the amount of new life insurance premiums underwritten as against the 8.9 % growth in Telangana and 8.2 % growth in the national average.¹ As in the year 2022, Andhra Pradesh accounts for just 3.5% of the country's total new life insurance premiums, a clear decline from the 7.2% share it enjoyed in 2015. These statistics and the staggering growth of life insurance consumption in the state poses many questions – Are people in Andhra Pradesh risk lovers? Do they have other means of self-insurance; say bequeathed wealth and human capital that renders the need to invest in life insurance policies redundant? Are there any economic, socio-cultural and demographic influences atypical to the population that governs

their choice to buy life insurance? Queries like these require ascertaining what influences a household's decision to purchase or not to purchase life insurance, and this exactly what this study aims to do.

Stated otherwise, the objective of this study is to identify the factors influencing a buyer's decision to purchase life insurance in the coastal districts of Andhra Pradesh. Using survey data on a sample of 600 households across the three districts of Andhra Pradesh i.e. Visakhapatnam, Srikakulam, and East Godavari, this study analyses what motivates an individual's probability of getting his life insured. Separate district-wise regressions are also undertaken to further demarcate how consumption decisions tend to vary across socio-economic and demographic clusters. we constructed separate logit models for each district. Robustness in the models was ensured by deploying clustered-robust standard errors, accounting for heterogeneity across districts and regions. The "Box-Tidwell tes and the link test" were used to identify model misspecifications. The "Hosmer-Lemeshow Chi-square test" evaluated each model's goodness of fit.

Using primary survey data on households from across three districts of coastal Andhra Pradesh, this study attempts to identify the proximate determinants of the decision to buy life insurance. The emphasis is on discerning the determinants and explanations that are general as well as specific to the population and region under study. Among other things, results show that the decision to buy life insurance is a positive function of income but then this effect is subject to the income-group in question. In case of regions with high-income disparities like Visakhapatnam, low-income groups have a negative tendency to go for life insurance and it is only a feature of high-income earning individuals. More importantly, the decision to buy life insurance is found to be a more pronounced function of socio-demographic aspects. Owing to children being viewed as potential human capital that can provide for the family's financial security in the future, the event of owing children results in low odds of getting life insured. Our robust finding that urban individuals have a greater tendency to go for insurance resonates the need to diversify the market to suit the needs and risks of rural population in the state, and the country.

6.2.3. On Life Insurance Demand in India: Key Influences

This Objective Studies traces use of extended time-series data to empirically examine the demand for life insurance in India. Despite their innovative role in providing an explanation for this requirement, their divergent results suggest that their explanations may be sensitive to methodological anomalies. This background provides space for the current study. In single-country macro level studies, ambiguity is uncalled for and deserves decisiveness in order to support effective policy decisions, unlike unit level studies where conclusions are inevitably sample specific and contextual. This report aims to resolve certain methodological shortcomings in previous research to determine the primary factors that determine the absolute and per capita demand for life insurance in India. Specifically, it deviates from previous research in terms of representation, accounts for bias resulting from collinearity, and utilizes statistical tests with increased power to more accurately determine and simulate the time-series characteristics of the macroeconomic variables. Most importantly, it adds to the body of knowledge by examining the asymmetric link between demand for life insurance and capacity to pay. By doing this, it verifies theorized duality of life insurance as a kind of saving and a consumer good through empirical evidence.

The foundation of our study is a partial equilibrium model, in which we take into account the relationship between a nation's demand for life insurance and its income, household savings, inflation, dependency ratio, and level of higher education attained. Since the model is based on Indian annual data from 1991–1992 to 2021–2022, time-series analysis is applicable to our study. The model's precise econometric specification depends on the type of data, how the variables are constructed, and the characteristics of the time series that are being employed.

The study suggested using the Autoregressive Distributed Lag (ARDL) and Nonlinear ARDL models to discover factors impacting the demand for life insurance in India, taking into account prior research and theoretical background. Regardless of different integration levels, it provides a comparative benefit in creating asymptotically long-run estimations. The Study performed unit-root tests (DF-GLS, KPSS, Lee-Strazicich) to ascertain each variable's integration level prior to implementing the ARDL approach.

The following summarizes the overall conclusion drawn from the estimates on life insurance density: Per capita demand for life insurance (lnD) in India is elastic to availability of funds or household savings, but this elasticity is asymmetric both in terms of magnitude and in

terms of direction. In essence, density tends to rise by 0.8 % to a per cent increase in savings in the long-run, but rises manifold (13 %) to a per cent decrease in savings. Simply put, the country's per capita demand for life insurance is positively inelastic to a rise in savings, but negatively elastic to a decrease in savings. This connotes that accumulated savings serves more as an end than as a means to financial or social security. Basically, Indian households do not just view their accumulated savings as the means to finance life insurance investments but also as wealth that can altogether substitute for social and financial security alternatives, so much so that a dip in this wealth risks their security, thus pushing them to go for life insurance. The long-run coefficients for inflation rate and higher education are -0.03 and +0.03, respectively. They both have expected signs. It is implied that soaring commodity prices require shelling out more funds/income on basic consumption expenses, such that less of it is available for investing in insurance. Also, to the extent that there exists no money illusion, structurally increasing inflation rates implies devaluation of the future insurance pay-back or benefits, thus making life insurance less lucrative for buyers. Accordingly, a percent increase in the country's rate of inflation causes per capita demand for life insurance to dip by -2.95%. Other things being equal, higher education generates greater awareness about the risk and the need to hedge against lost family income overtime. The more educated the population, greater the demand for life insurance. Elasticity wise, a per cent increase in enrolment to higher education causes a 3.04% increase in life insurance density in the long-run. Similar inferences can be drawn from the short-run estimates except that although per capita demand for life insurance is reactive to an instantaneous decrease in per capita savings, it does not significantly respond to a contemporaneous increase, essentially conveying that the positive influence of wealth (or savings) on demand for life insurance is a long-run phenomenon. In other words, per capita life insurance expenditure is more a function of permanent wealth rather than current wealth holdings.

The following is the economic intuition derived from the estimates on life insurance Penetration: The country's household savings per capita ($\ln S$) have an asymmetric effect on her aggregate demand for life insurance ($\ln P$). Demand responds strongly and inversely to a fall in savings per capita (5.56 %), and positively to an increase in savings (1.96 %), thereby reaffirming our conjecture that saved funds do not just raise the ability to pay premiums but acts more fervently as wealth capital and self-insurance, thus, eroding the need for market life insurance. The coefficient on EDU variable reestablishes that demand for insurance is elastic to higher education, *ceteris paribus*. A percent rise in secondary education enrolment raises

the economy's aggregate expenditure on life insurance premiums by 3.04%. Aggregate premium expenditure does not seem to be significantly affected by inflation rate (gWPI) for the sample period, albeit having the correct negative sign. Markedly, increasing number of young dependents (DR) in the country swells consumption of life insurance conveying that the bequest motive behind life insurance purchase stands. Perhaps, the insignificance of dependents in the density model is due to the per capita construction of the density variable wherein the effect of increasing number of young children on premium expenses is offset by its impact on population size.

In closing, between the model on life insurance demand per capita (lnD) and demand in aggregate (lnP), the former offers better fit and stability. The stability diagnostics of the NARDL model for lnP (Appendix III) hints at the presence of intercept-type structural breaks for the sample period. Since stability is imperative to make valid inference, we round off with the conclusions from the model on life insurance density. That is, per capita demand for life insurance in India is a negative function of inflation rate, a positive function of higher education and an asymmetric function of household savings per capita or the ability to pay for life insurance.

6.3 Limitations and Scope for Future Research:

There are certain limitations to the thesis. The research only included short-term time series (1991-92 to 2021-22). Consequently, the study did not examine how changes in institutional structure, regulations, or political instability can affect the demand for life insurance. The study focused on gross premium expenditure, encompassing both new premiums and renewals of old premiums. However, a more detailed examination by separating these components could have provided insights into the factors of purchasing insurance.

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Chapter 3 Appendix

Table : Financial Performance of LIC- 1957 to 2001(Rs. Billions)

Year	1957	1963	1972-73	1982-83	1992-93	2001-02
Income						
Total premium income	0.9	1.5	3.9	12.2	179.9	498.2
Income from investment, including misc. income	0.2	0.4	1.4	6.9	42.6	239.6
Total income	1.1	1.9	5.3	19.1	122.4	737.8
Expenditure						
Commission, etc, to agents	0.1	0.1	0.4	1.0	7.7	45.9
Salaries and other benefits to employees	0.1	0.2	0.6	1.2	8.0	31.6
Other expenses of management	0.0	0.1	0.1	0.4	2.6	9.2
Taxes etc	-	-	0.0	0.5	4.2	11.4
5 % valuation surplus paid to the Government	-	-	-	-	1.1	8.1
Payments to policyholders						
Claims by maturity	0.2	0.3	0.8	3.5	22.4	122.2
Claims by death	0.1	0.1	0.3	0.9	5.1	21.4
Annuities	0.0	0.0	0.0	0.1	1.0	10.1
Surrenders	0.0	0.1	0.2	0.8	7.2	22.9
Total Expenditure	0.6	1.0	2.3	8.4	59.4	282.8
Operating cost/premium income (%)	27.7	29.3	27.9	21.5	22.9	17.4
Operating cost/total income (%)	22.7	23.8	20.6	13.7	14.9	11.8

Source: Malhotra Committee Report, 1994, Appendix 26, p. 148.

Table 3.9: Share of each fund in total assets under management (In percentage)

Year	Life Fund	Pension & Group Fund	ULIP Fund	Total
2000- 01	100.00	0.00	0.00	100.00
2001-02	100.00	0.00	0.00	100.00
2002-03	88.14	11.76	0.10	100.00
2003-04	87.15	12.37	0.48	100.00
2004-05	85.48	12.77	1.76	100.00
2005-06	81.53	13.15	5.31	100.00
2006- 07	77.06	11.85	11.10	100.00
2007-08	70.71	11.91	17.37	100.00
2008-09	68.71	12.44	18.85	100.00
2009-10	60.79	11.69	27.52	100.00
2010-11	58.81	13.28	27.91	100.00
2011-12	61.64	14.97	23.40	100.00
2012-13	64.19	16.18	19.63	100.00
2013-14	65.81	17.25	16.94	100.00
2014-15	66.53	17.33	16.14	100.00
2015-16	67.84	18.55	13.61	100.00
2016-17	66.85	19	13.31	100.00
2017-18	67.03	21.12	11.85	100.00
2018-19	66.44	21.91	11.65	100.00
2019-20	67.32	23.08	9.60	100.00
2020-21	65.05	23.28	11.67	100.00

Source: Handbook on Indian Insurance Statistics, 2020-21

Table- 3.10: Investment Made by Total Life Insurance Industry(Rs Crores)

Year	Central Govt Securities	State Govt & Other Approved Securities	Infrastructure Investments	Approved Investments	Other than Approved Investments (OTAI)	Total
2000-	47512.68	52523.95	24886.86	50502.28	18583.83	194009.60
2001-02	128813.1 (171.11)	3364.38 (-93.59)	20740.87 (-16.66)	60928.74 (20.65)	16521.65 (-11.10)	230368.74 (18.74)
2002-03	139939.3 (8.64)	28492.69 (746.89)	32962.63 (58.93)	52255.25 (-14.24)	6902.59 (-58.22)	260552.48 (13.10)
2003-04	169212.1 (20.92)	38596.03 (35.46)	38636.84 (17.21)	89222.95 (70.74)	16956.56 (145.66)	352624.52 (35.34)
2004-05	201549.9 (19.11)	51186.89 (32.62)	45521.01 (17.82)	103020.72 (15.46)	27173.39 (60.25)	428451.91 (21.50)
2005-06	238089 (18.13)	58288.17 (13.87)	49638.45 (9.05)	111949.41 (8.67)	29185.68 (7.41)	487150.69 (13.70)
2006-07	275098.8 (15.54)	60088.43 (3.09)	69836.78 (40.69)	159644.6 (42.60)	39511.17 (35.38)	604179.81 (24.02)
2007-08	296687.5 (7.85)	85198.11 (41.79)	63262.13 (-9.41)	257183.14 (61.6)	63638.49 (61.06)	765969.33 (26.78)
2008-09	316009.8 (6.51)	107189.59 (25.81)	66673.33 (5.39)	353958.85 (37.63)	72533.26 (13.98)	916364.78 (19.68)
2009-10	360446.8 (14.06)	137235.62 (28.03)	85674.54 (28.50)	568752.27 (60.68)	60348.72 (-16.80)	1212457.93 (19.63)
2010-11	420951.8 (16.79)	173733.34 (26.59)	89180.75 (4.09)	676875.44 (19.01)	69376.25 (14.96)	1430117.57 (32.31)
2011-12	468082.4 (11.20)	214515.2 (23.47)	97319.92 (9.13)	731447.35 (8.06)	69893.97 (0.75)	1581258.7 (17.95)
2012-13	512179.79 (9.42)	265989.19 (24.0)	118878.35 (22.15)	781538.59 (6.85)	66307.95 (-5.13)	1744893.87 (10.35)

Year	Central Govt Securities	State Govt & Other Approved Securities	Infrastructure Investments	Approved Investments	Other than Approved Investments (OTAI)	Total
2013-14	5,18,824.47 (17.65)	2,55,469.45 (19.12)	1,55,025.90 (30.41)	3,29,787.31 (11.19)	29,117.83 (40.68)	12,88,224.97 (15.02)
2014-15	6,23,292.85 (20.14)	3,28,728.88 (28.68)	1,74,510.99 (12.57)	3,42,583.28 (3.88)	26,193.14 (10.04)	14,95,309.14 (16.08)
2015-16	6,96,565.69 (11.76)	3,77,438.21 (14.82)	1,86,111.54 (6.65)	4,04,192.44 (17.98)	33,145.06 (26.54)	16,97,452.94 (13.52)
2016-17	7,92,927.97 (13.83)	4,42,415.82 (17.22)	2,00,437.68 (7.70)	4,05,477.32 (0.32)	66,694.09 (101.22)	19,07,952.88 (12.40)
2017-18	8,78,610.24 (10.81)	5,02,518.76 (13.59)	2,33,327.15 (16.41)	4,50,054.92 (10.99)	72,969.46 (9.41)	21,37,480.53 (12.03)
2018-19	9,78,084.58 (11.32)	5,25,454.25 (4.56)	2,53,187.33 (8.51)	4,66,588.35 (3.67)	1,24,140.54 (70.13)	23,47,455.05 (9.82)
2019-20	11,10,474.87 (13.54)	5,86,417.82 (11.60)	2,75,434.14 (8.79)	5,08,685.01 (9.02)	1,38,144.68 (11.28)	26,19,156.52 (11.57)
2020-21	12,79,452.93 (15.22)	6,28,647.05 (7.20)	2,98,038.53 (8.21)	5,73,226.65 (12.69)	1,34,918.53 (-2.34)	29,14,283.69 (11.27)

Source: Handbook on Insurance Statistics India 2011 to 12.

Note: The figure in the bracket indicates the growth over the previous year in percent.

Table 3.11: New Policies Issued by Life Insurance (in Crores)

Year	Type of business		
	LIC Issued policies	Private Sector-Issued Policies	Total
2002-03	245.45	8.25	253.70
2003-04	269.68(9.87)	16.58(101.05)	286.26(12.83)
2004-05	239.78(-11.09)	22.33(34.62)	262.11(- 8.44)

2005-06	315.90(31.75)	38.71(73.37)	354.61(35.29)
2006-07	382.29(21.01)	79.22(104.64)	461.51(30.14)
2007-08	376.12(-1.61)	132.61(67.40)	508.73(10.23)
2008-09	376.12(-4.52)	150.11(13.19)	509.24(0.10)
2009-10	388.63(8.21)	143.62(-4.32)	532.25(4.52)
2010-11	370.38(-4.70)	111.14(-22.61)	481.52 (-9.53)
2011-12	357.51(-3.47)	84.42(-24.04)	441.93(-8.22)
2012-13	367.82 (2.88)	74.05 (-12.28)	441.87 (-0.01)
2013-14	345.12 (-6.17)	63.6 (-14.11)	408.72 (-7.50)
2014-15	201.71 (-41.55)	57.37 (-9.79)	259.08 (-36.31)
2015-16	205.47 (1.86)	61.93(7.92)	267.38 (3.20)
2016-17	201.32 (-2.02)	63.24(2.13)	264.56(-1.05)
2017-18	213.38 (5.98)	68.59(8.47)	281.97(6.58)
2018-19	214.04 (0.31)	72.44 (5.61)	286.48 (1.70)
2019-20	218.96 (2.30)	69.5 (-4.05)	288.47 (0.69)
2020-21	209.75 (-4.21)	71.52 (2.90)	281.27 (-2.49)

Source: Various Annual Reports of IRDA from 2000-01 to 2011-12.

Note: The figure in bracket indicates the growth over the previous year in percent

Table 3.13: Number of Offices of Life Insurers India, 2000-01 to 2020-21

Year	Type of business		
	Private sector	LIC	Total
2000- 01	13	2186	2199
2001-02	116	2190	2306
2002-03	254	2191	2445
2003-04	416	2196	2612
2004-05	804	2197	3001

Year	Type of business		
	Private sector	LIC	Total
2005-06	1645	2220	3865
2006- 07	3072	2301	5373
2007-08	6391	2522	8913
2008-09	8785	3030	11815
2009-10	8768	3250	12018
2010-11	8175	3371	11546
2011-12	7712	3455	11167
2012-13	6759	3526	10285
2013-14	6193	4839	11032
2014-15	6156	4877	11033
2015-16	6179	4892	11071
2016-17	6057	4897	10954
2017-18	6204	4908	11112
2018-19	6347	4932	11279
2019-20	6355	4955	11310
2020-21	6090	4970	11060

Source: Various Annual Reports of IRDA from 2000-01 to 2020-21.

Table 3.14: Distribution of Offices of Life Insurers

Insurance	Metro	Urban	Semi-Urban	Rural	Total
Private	1929	2997	1371	58	6355
LIC	861	979	2940	175	4955
Industry	2790	3976	4311	233	11310

Source: Various Annual Reports of IRDA from 2000-01 to 2020-21.

Table 3.15: Operating Expense and Operating Expense ratio of life insurers (Rs. Cr)

Year	Type of business		
	LIC	Private sector	Total
2001-02	4260.39 (17.62)	419.36(187.5)	4679.75(18.54)
2002-03	4571.75(17.55)	838.27(85.59)	5410.02(18.90)
2003-04	5186.49(8.16)	1402.44(44.95)	6588.93(9.89)
2004-05	6241.26(8.31)	2229.46(28.84)	8470.72(10.22)
2005-06	6041.55(6.65)	3568.13(23.67)	9609.68(9.08)
2006-07	7085.84(5.54)	6500.01(23.01)	13585.85(8.70)
2007-08	8309.32(5.55)	12032.46(23.34)	20341.78(10.10)
2008-09	9064.29(5.76)	16659.60(23.01)	25723.89(11.60)
2009-10	12245.82(6.58)	16641.81(20.97)	28887.63(10.88)
2010-11	16980.28(8.35)	15962.02(18.10)	32942.30(11.30)
2011-12	14914.00(7.35)	14742 (17.51)	29656.00 (10.33)
2012-13	16708.00 (8.00)	14854 (18.95)	31562.00 (10.99)
2013-14	23760.70 (10.03)	13704.71 (17.72)	37465.41(11.92)
2014-15	22395.45 (9.34)	14463.72 (16.36)	36859.16 (11.23)
2015-16	22691.83 (8.52)	16086.06 (16.01)	38777.89 (10.57)
2016-17	28952.06(9.64)	17186.82(14.57)	46138.88(11.03)
2017-18	30142.40(9.47)	18677.27(13.29)	48819.66(10.64)
2018-19	28182.02(8.65)	21948.24(12.86)	51130.26(10.06)
2019-20	34,568.04((9.11)	25,552.96(13.20)	60,121.00(10.49)
2020-21	34,990.00 (8.68)	26,433 (11.72)	61,422.00(9.77)

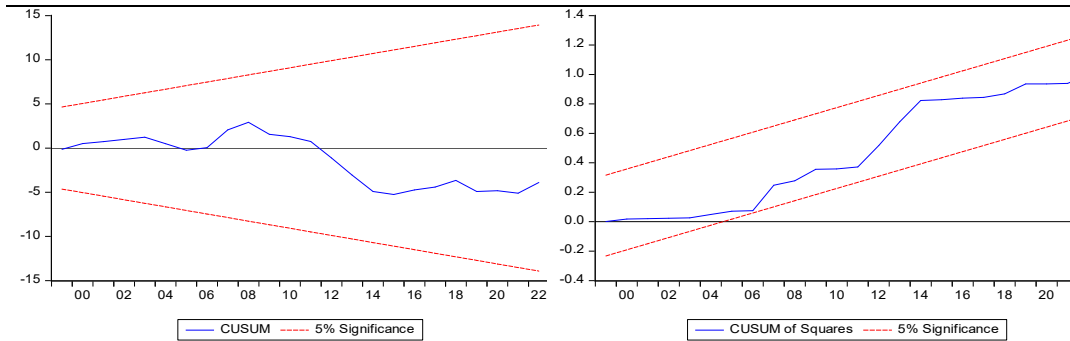
Source: Compiled from the annual reports of IRDA from 2000-01 to 2020-21.

Chapter 5 Appendix

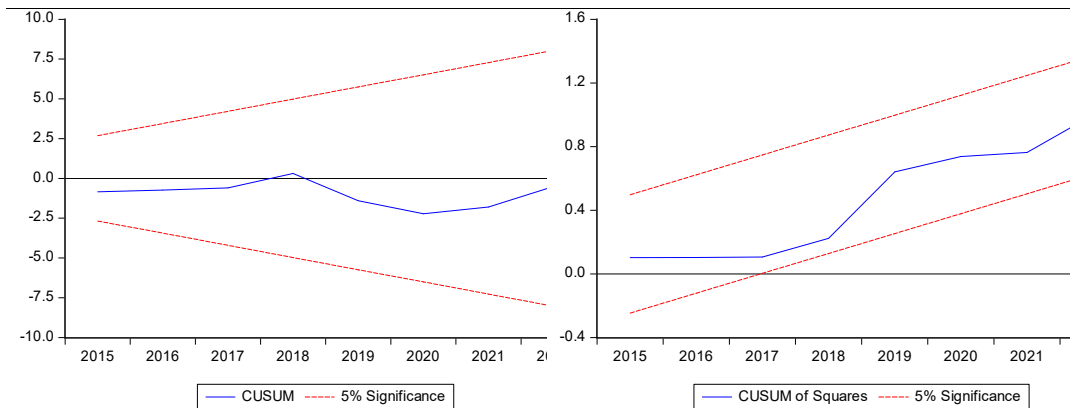
Appendix:

Appendix II. Stability Tests: Life Insurance Density Model

ARDL Model

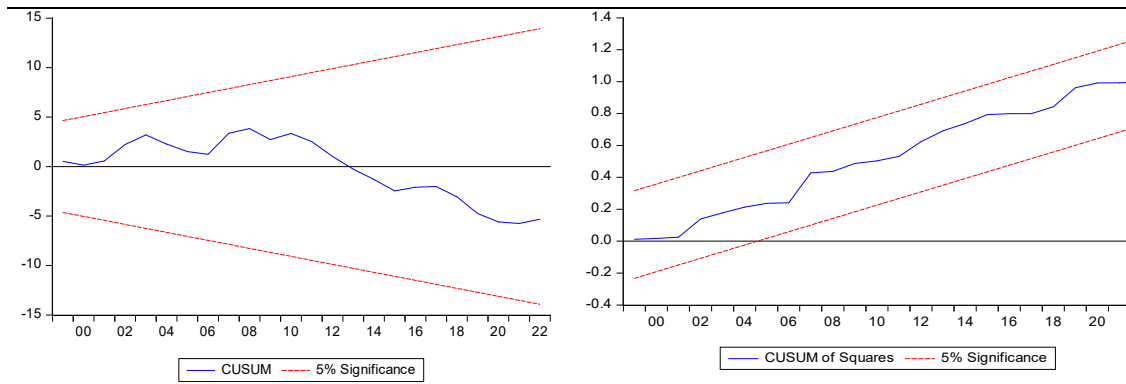


NARDL Model

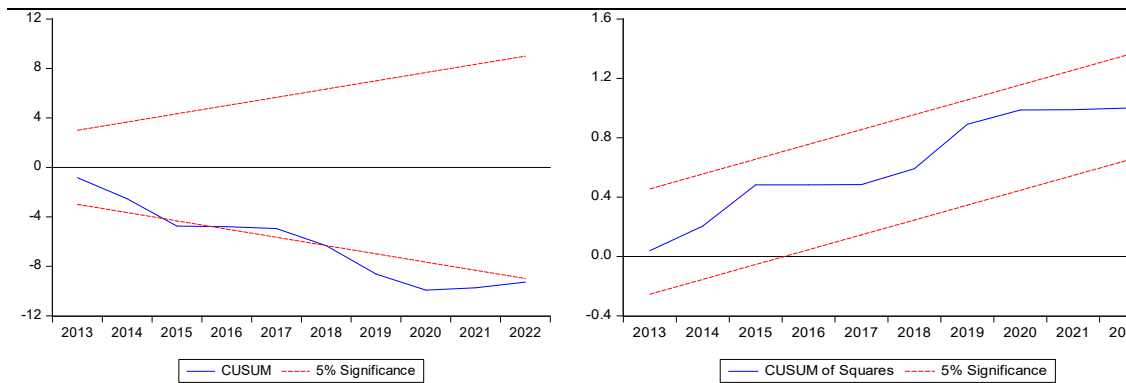


Appendix II. Stability Tests: Life Insurance Penetration

ARDL Model

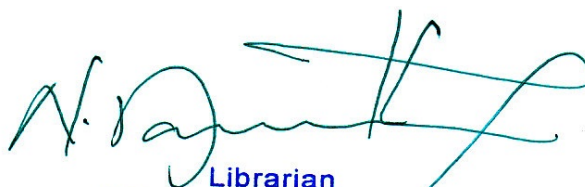


NARDL Model



UNDERSTANDING LIFE INSURANCE BUYER'S DECISIONS: A CASE STUDY OF COASTAL DISTRICTS IN ANDHRA PRADESH

by JETTI SWAROOPA



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Emerging Trends and Challenges in Life Insurance Industry in India

Swaroop Jetti

Abstract: Insurance has a long history in India. Life Insurance in its current form was introduced in 1818 when the Oriental Life Insurance Company began its operations in India. History of Insurance in India can be broadly bifurcated into three eras: a) Pre-Nationalization b) post-Nationalization and c) post-liberalization. Life Insurance was the first to be nationalized in 1956. The rapid expansion of Insurance companies since nationalization has given rise to a number of problems related to the image, operational efficiency, productivity, distribution, and the quality of the portfolio of the system as a whole. Liberalization and privatization of the insurance sector have offered tremendous opportunities and since the onset of reforms, the life insurance corporation has been compelled to review philosophy and method of working, in order to be ready for competition with private sector companies. The present study attempts to evaluate the emerging trends in the growth, performance, and issues, challenges facing by the life Insurance industry in India. The study reveals that the life insurance market has witnessed dynamic changes due to liberalization and privatization of the insurance sector and the industry witnessed significant growth, which is mainly contributed by both private sector and public sector. The study further reveals that the Private Sector life Insurance Companies' results present better efficiency in terms of expenses of management ratio, and they are increasing their market share year by year, and the distribution of offices expanded. Whereas the performance of Public Sector in terms of net earnings, and return on net worth ratio is better than Private Sector and in case of operating expense ratio also better than the private sector, public sector is also playing a major role in contributing the Premium Income in the life insurance industry. The study highlights that private sector insurance companies are suffering from losses when it comes to their core insurance business, but still manage to get net earnings, which is mainly ascribed to the investment income. The study concludes that, undoubtedly, the entry of Private Sector Insurance Companies has contributed to the strengthening of life Insurance business as a whole by creating a competitive atmosphere, but still public sector is playing dominant role in the Indian life insurance industry. But when comes to the issues and challenges, total industry (both private and public sectors) facing challenges like low penetration and density, low rural market share, low satisfaction of customer services, Delayed Break-even for Private Insurance Companies, Money laundering, Distributional Channel problems, Marketing of Products through Online Issues, Regulatory Challenge and so on.

Keywords: life insurance, pre, and post-nationalization, reforms in insurance, and trend analysis, issues and challenges.

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1. Introduction

The insurance sector is a major contributor to the financial savings of the household sector in the country, which are further channelized into various investment avenues. Insurance sectors in India have experienced a 360-degree journey over a period of more than a hundred years. Its transition from an open competitive sector to nationalization and then back to a liberalized market characterizes this phenomenon.

2. Historical Review of Indian Life Insurance

The perception of life insurance had been existed since the ancient time in India in different forms. The uses of insurance were also mentioned in the Rig-Veda by the Aryans. The origin of insurance has been in the form of marine insurance just like in other countries and there was a system of marine insurance for the protection from sea hazards. Religious and spiritual approaches of the people were the main hurdles in the way of top-level development of life insurance. An organized effort for the development of life insurance in India was started in 1870. In this year, Mutual Life Insurance Society Limited was established in Bombay. Life Insurance in its modern form came to India from England in the year 1818. The Oriental Life Insurance Company was started in Calcutta by Europeans as the first Life Insurance Company. Later with

the efforts of eminent people like Baba Muttylal; the foreign life insurance company started insuring Indian lives. The Swedish (indigenous) movement of 1905 also affected life insurance. The first decade of the 20th century was the period of fast development of the insurance business and many new companies were established in that period. The development of life insurance business was also blocked during the time of the First World War. But along with the changing circumstances during the war period, new insurance companies were established firms like New India, Jupiter, and Lakshmi. In 1914, the Government of India started publishing returns of Insurance Companies in India. The Indian Life Assurance Companies Act, 1912 was the first statutory measure to regulate life business. In 1928, the Indian Insurance Companies Act was enacted to enable the Government to collect statistical information about both life and non-life business transacted in India by Indian and foreign insurers including Provident Insurance Societies. In 1938, with a view to protecting the interest of the Insurance public, the earlier legislation was consolidated and amended by the Insurance Act, 1938, with comprehensive provisions for effective control over the activities of insurers. The Insurance Amendment Act, 1950, abolished Principal Agencies. However, there were a large number of insurance companies and the level of competition was high. There were also allegations of unfair trade practices, mismanagement and malpractices, manipulation of life funds to indulge in

speculative trading, large scale liquidation of insurance companies, interlocking of funds, and control and influence of large business houses which led to public disenchantment and resentment (Rajan and Dhunna, 2002). This led to the nationalization of Life Insurance by amalgamating all private companies under one corporation, i.e. Life Insurance Corporation in 1956.

An Ordinance was issued on 19th January, 1956, nationalizing the Life Insurance Sector, and Life Insurance Corporation came into existence in the same year. The LIC absorbed 154 Indian, 16 non-Indian insurers as also 75 Provident Societies - 245 Indian and foreign insurers in all. The LIC had its monopoly till the late 90s when the Insurance sector was reopened to the private sector. Before that, the industry consisted of only two state insurers: Life Insurers (Life Insurance Corporation of India, LIC), and General Insurers (General Insurance Corporation of India, GIC), GIC had four subsidiary companies. However, the Government made a paradigm shift in the economic policy by adopting the process of liberalization, privatization and globalization at the end of the previous decade. Consequently, a committee was set up under the chairmanship of Mr. Malhotra, Ex-governor of RBI, for undertaking various reforms in the insurance sector in the light of new economic policy. The Committee, which submitted its report in 1993 recommended the establishment of a special regulatory agency along the lines of SEBI and the opening of the insurance industry in the private sector.

The committee further recommended for enacting of the Insurance Regulatory and Development Authority (IRDA) Act in 1999, and established IRDA to regulate the insurance business in the country. As a result, the private sector was allowed entry both in general and life insurance sectors in India. IRDA also allowed foreign participation up to 26% in equity shareholding of private companies. Recently it has increased to 49%. As a result, many companies (both in general and life insurance) got themselves registered with IRDA to operate in India. Presently, twenty-three life insurance companies are operating in the private sector, in addition to LIC from the public sector, and twenty-seven non-life insurance companies are operating in the private sector in addition to six companies from the public sector.

While the effects of privatization and globalization on the life insurance firm's performance have received the bulk of attention in the national and international business research and has suggested that liberalization has a positive long-term effect on economic growth and firm's performance, except the last couple of years. (Dollar, 1992; Sachs and Warner, 1997; Chennappa, 2006; Sinha, 2006; Detzel & Banerjee, 2008; Anshuja and Babita, 2012). Relatively little has been said about emerging trends and challenges of life insurance industry in India in the post-reforms period. The present study seeks to fill the research gap and attempts to analyze the growth, emerging trends, and challenges for life insurance industry in India in the post-liberalization period.

3. Review of Literature

- 1) (Kannan, 2010). The growth of Insurance in India was very low in the pre independence. After the nationalization of Insurance in 1956, which gave it a formal shape of an industry.
- 2) (Sonika & Kiran, 2011), Life insurance industry expanded tremendously from the year 2000 onwards in terms of number of offices, number of agents, new business policies, premium income etc.
- 3) Selva and Priyan (2011). India was in 20th place in the global insurance league table when the market opened to private players in the year 2000, moved up to 11th place in 2010.
- 4) (Shilpa & Runa, 2006),. The opening up of the insurance sector has led to the rapid growth of the sector. Insurance sector achieved rapid growth after the adoption of liberalization policies.
- 5) Krishnamurthy (2005), India was one of the least insured countries in the last few decades of the 20th century. At this juncture, opening of the insurance sector to private companies viewed with optimism and aimed at fostering competition and innovation through a greater variety of products.
- 6) Sanjay (2012) argues that developed countries have higher rate of insurance penetration, whereas developing and underdeveloped nations have a relatively lesser rate of it.
- 7) Rajendran & Natarajan (2009) found that the businesses in India, the business outside India as well as the total business of LIC are always in an increasing trend and the LPG is incorporating a positive influence on LIC of India and its performance.
- 8) Harpreet and Preeti (2011). The LPG is making a positive influence on LIC of India and its performance.
- 9) But Anshuja and Babita (2012) argue in an exact opposite way. The private insurance companies are expanding their business and giving tough competition to LIC. It is also revealed that the market share of LIC declined to 70.10% in 2009-10 from 99.46% in 2001-02. Sanjay (2012) also derived similar conclusions.
- 10) Srujan (2006) made an attempt to explore the current situation in the Insurance industry, and particularly in rural India this study observed that divergence in the penetration level of the urban and rural insurance markets. There is a significant difference in the insurance coverage in these two markets.

4. Need of Study

In traditional societies in India, the joint family system itself used to provide insurance and security to the family members. The combined management of finances used to protect the individual and his wife and children under the joint family system, in the extreme case of his sudden demise. But now with the growth of nuclear families and modern style of living, the individual and his family face many risks and require some external support in case of an accident or sudden demise. The human life has become very unpredictable. The above unpredictability is due to human aggressive and violent

behavior, but there is another element which shapes human life - that is nature. For ages human efforts to understand nature have its ups and downs. But nature never lets us understand it and we, humans ourselves, in the name of modernism, destroying the balance of nature around us. In a way, to survive in this erratic world and hedge the risks faced by us require some form of insurance, be it government-sponsored or self-sponsored. As the human needs increased, insurance cover has also increased in different dimensions. More and more new innovations and products are entering the market. With this explosion of new products, technologies, and practices, players and regulators brought out plenty of issues which are to be analyzed in a systematic way and find some amicable solutions. Here, various issues were highlighted and were studied analytically. Today, the insurance industry is one of the fastest growing industries in the country and offers unlimited growth potential for the insurance sector. The low performance, poor customer services, ineffective marketing techniques, low insurance penetration and density are some of the problems facing the insurance sector.

When compared with the developed foreign countries, the Indian insurance industry has achieved only a little because of the lack of quality strategies adopted by the insurance industry, lack of standard education and awareness about savings, low per capita income and lack of employment opportunities. Since the introduction of new economic policy (LPG) in the year 1991, the shape of the Indian insurance industry has changed and it has geared up. The huge and ever rising population levels in our country provide an attractive opportunity for the global insurance majors to seek their fortunes here. That is the reason why we find so many private players today competing with the insurance sector in India.

Hence the present study has been taken up to analyze the present trends in post-liberalization period, and the benefits to

the industry after opening up of the sector to the private and foreign insurers and emerging issues, challenges faced by the Indian insurance sector since LPG era.

Objectives of study

- 1) To study the emerging trends in the growth and performance of life insurance industry in India.
- 2) To highlight the issues and identify the challenges faced by the Indian life insurance industry.

Trend analysis of life insurance sector in India

Today, trend analysis often refers to the science of studying changes in social patterns. Trend Analysis is the practice of collecting information and attempting to spot a pattern, or trend, in some fields of study. The "trend analysis" is used for comparing one year with another year. In the analysis given below we have taken three periods, namely, pre-nationalization period, post-nationalization period, and post-reform period. The intention is to compare one period to another, and one year to another, and to see how trend percentages and growth increase or decrease, and to study the changes that have taken place in the industry, and how it helps for the development in the economy. This method is suitable to compare different years at a time. Also, this is easy to understand and easy to calculate. The present study trend analysis in the life insurance industry is explained below.

The trends and changes in the life insurance industry are analyzed by dividing the whole period into three parts - first, pre-nationalization period; second, post nationalization period; and third, post-reform period. The study mainly focuses on the post-liberalization period, which is from the year 2000 to 2013. To capture the emerging trends and changes in the life insurance industry, we have employed the following indicators - penetration, density, market share, total premium income, investments, operating expenses, profits, number of offices, number of companies, etc.

Table 1: Life Insurance Business in Pre-Nationalization Period

Year	1914	1915	1920	1925	1930	1935	1940	1945	1950	1955
No. of insurers	49	-	-	-	-	-	-	215	-	245
No. of Indians	36	40	43	49	110	215	179	198	185	149
New business										
No. of policies (000)	-	-	28	43	145	239	206	599	498	831
Sum Assured (Rs crore)	3.2	2.25	5.16	8.15	27.5	43.5	36.11	136.3	139.5	260.8
Total business										
No. of policies (000)	-	-	-	-	564	1095	1553	2392	3280	4782
Sum assured (Rs Crores)	-	-	-	-	124	235	286	557	780	1220
Life fund (Rs Crores)	6.36	6.77	8.47	12.57	20.53	35.19	62.41	107.4	181.5	299.7

Source: Indian Insurance Year Book, Agarwala (1961:21-73), Bhawe (1970:340-51)

The above table explains **Life Insurance Business in Pre-Nationalization Period 1914 to 1955**. The no. of Indian insurance companies was 36 out of 49 total insurance companies that existed in 1914. The number of Indian companies increased to 198 by 1945 but came down to 149 in 1955. The total number of insurance companies in 1955 was 245. The total premium was only Rs 3.2 crores in 1914. It increased to Rs 43.5 crores in 1935 and then it reached Rs

260.8 crores by 1955. The number of new policies grew from 28,000 to 8, 31,000 during the period 1920 to 1955. The total number policies in 1930 was 5, 64,000 which grew to 47, 82,000 by 1955. The total Life fund was Rs 6.36 crores in 1914 which increased to Rs 299.7 crores by 1955. On the whole, life insurance had moderate growth in the pre-nationalization period and the reach of insurance was rather

unsatisfactory. The coverage was very low and the insurance business underwent a lot of challenges during this period.

Post nationalization period

Table 2: Financial Performance of LIC- 1957 to 2001(Rs. Billions)

Year	1957	1963	1972-73	1982-83	1992-93	2001-02
Income						
Total premium income	0.886	1.511	3.897	12.18	179.872	498.22
Income from investment including misc. income	0.193	0.357	1.366	6.894	42.57	239.6
Total income	1.079	1.863	5.263	19.074	122.442	737.82
Expenditure						
Commission, etc to agents	0.077	0.141	0.368	1.027	7.726	45.94
Salaries & other benefits to employees	0.122	0.223	0.581	1.197	7.998	31.62
Other expenses of management	0.046	0.079	0.137	0.39	2.56	9.21
Taxes etc	-	-	0.002	0.538	4.227	11.36
5 % valuation surplus paid to government	-	-	-	-	1.054	8.14
Payments to policyholders						
Claims by maturity	0.208	0.318	0.77	3.507	22.436	122.15
Claims by death	0.079	0.126	0.261	0.864	5.082	21.42
Annuities	0.005	0.004	0.015	0.078	1.042	10.082
Surrenders	0.044	0.051	0.192	0.782	7.248	22.91
Total Expenditure	0.581	0.954	2.326	8.383	59.373	282.83
Operating cost/premium income (%)	27.65	29.32	27.87	21.46	22.89	17.42
Operating cost/total income (%)	22.71	23.78	20.63	13.7	14.93	11.76

Source: Malhotra Committee Report, 1994, Appendix 26, p. 148.

Table 2 explains financial performance of LIC during the period 1957 to 2001. The total income of LIC grew from Rs 1.079 billion in 1957 to Rs 737.82 billion in 2001-02. It increased nearly 700 times. The largest part of payments to the policyholders was through the maturity of policies. This proportion went up during that period, compared to death benefits. To a certain extent, this reflects the increasing

popularity of life insurance products pertaining to savings. It can also be discerned that the operating costs (as percentage of premiums) remained high over a sustained period of time, but declined during the past two decades. A part of this reduction was due to the increased sale of group policies which are cheaper than individual life policies.

Table 3: Distribution of Investment Portfolio of the LIC 1980-2000 (In percentage)

Year	Loan to Government	Government bonds	Special Government bonds	Unapproved schemes	Foreign investment	Total
1980-81	41.7	55.0	1.6	1.1	0.6	100
1990-91	33.6	59.2	5.6	1.1	0.5	100
1991-92	4.9	85.5	6.9	1.9	0.8	100
1992-93	34.1	60.1	4.2	1.1	0.5	100
1993-94	31.4	63.4	3.6	1.1	0.5	100
1994-95	28.7	66.4	3.3	1.1	0.6	100
1995-96	26.5	69.0	2.9	1.2	0.5	100
1996-97	24.8	71.2	2.6	0.9	0.5	100
1997-98	23.1	73.3	2.4	0.8	0.4	100
1998-99	21.7	75.4	1.8	0.8	0.3	100
1999-00	19.8	77.9	1.4	0.6	0.3	100
2000-01	18.3	79.8	1.1	0.5	0.3	100

Source: Life Insurance Corporation annual reports of various years

From the above table, we can understand the distribution of Investment Portfolio of the LIC in the post- nationalization period. The first item of "Loans to state and central government and their corporations and boards" steadily fell from 42% to around 18% in twenty years. In their place, the share of the second item "Central government, state government, and local government securities" went up steadily from 55% in 1980 to 80% in 2000.

As such, the LIC (along with the State Bank of India) became one of the two largest owners of government bonds in India. It can be seen that the companies so far refrained from investing

in equities or overseas. Recently, however, the LIC took a more aggressive stance in boosting its equity investment, both through private placements and secondary market purchases in the stock exchanges. In the financial year 2003-2004, it recorded an equity investment profit of INR 2,400 crores.

Overall, the performance of LIC was satisfactory in terms of premium, claims settlement, but coverage and reach were very low.

Liberalization Era of Life Insurance

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There was a remarkable improvement in the Indian insurance industry soon after the Indian economic reform 1991. The insurance business in India was opened on two fronts. Firstly, domestic private-sector companies were permitted to enter the life insurance business. Secondly, foreign companies were allowed to participate, albeit with a cap on shareholding at 26%.

The study mainly focuses on the post liberalization period, from the year 2000 to 2013. To ascertain the emerging trends and changes in the life insurance industry, the following indicators - penetration, density, market share, total premium income, investments, operating expenses, profits/losses, etc. are employed.

Now it can be seen how the trend changed in the Indian insurance industry over a decade of the post - reform period through the following table.

Table 4: Life Insurance Penetration and Density in India - 2000 to 2014

Year	Density (USD)	Penetration (in %)
2001- 2002	9.1	2.75
2002-2003	11.7	2.59
2003-2004	12.9	2.26
2004-2005	15.7	2.53
2005-2006	18.3	2.53
2006- 2007	33.2	4.10
2007-2008	40.4	4.00
2008-2009	41.2	4.00
2009-2010	47.7	4.60
2010-2011	55.7	4.40
2011-2012	49.0	3.40
2012-2013	42.7	3.17
2013-2014	41.0	3.10

Source: Various Annual Reports of IRDA from 2000-01 to 2013-14.

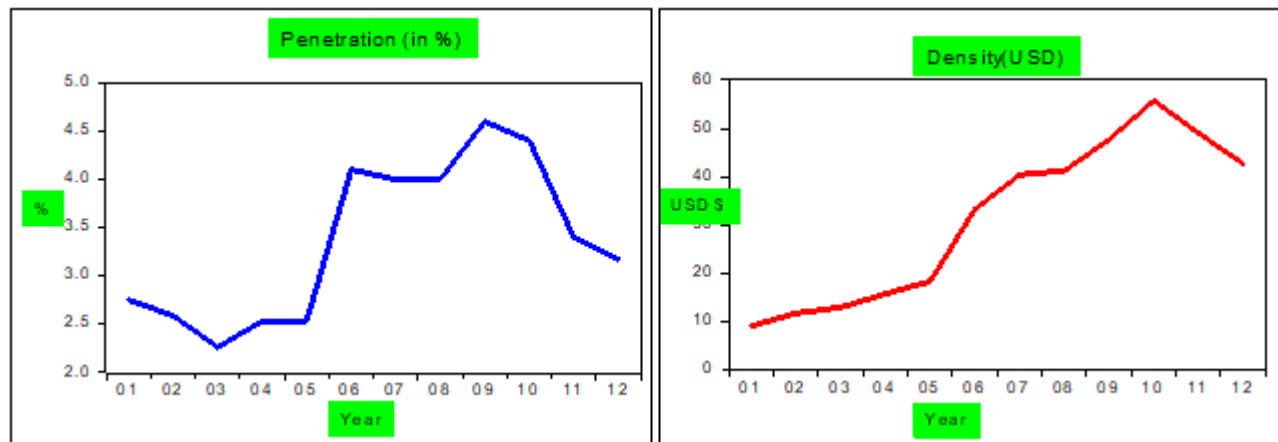


Diagram 1

The measure of insurance **penetration and density** reflects the level of development of insurance sector in a country. While insurance penetration is measured as a percentage of insurance premiums to GDP, insurance density is calculated as a ratio of premium to total population (per capita premium).

During the first decade of insurance reforms, the industry reported a consistent increase in insurance penetration from 2.75% in 2001-02 to 4.60 % in 2009-10. But since then, the level of penetration started declining and it reached 3.17% in 2012-13. This indicates that during the past three years, the growth in insurance premium is lower than the growth in national GDP. Insurance density also saw a similar trend in the post- reform period. The insurance density of life insurance business went up from USD 9.1 in 2001-02 to reach the peak at USD 55.7 in 2010-11, But since then the level of density started declining and reached 42.7 in 2012-13. Both the values of density and penetration are very low compared to those of advanced countries. This indeed one of the challenges to the Indian Insurance Companies.

Table 5: Market Share of Life Insurance - 2000 to 2014 (In percentage)

Year	Types of Business		
	Public (LIC)	Private	Total
2000-2001	99.98	0.02	100
2001-2002	99.46	0.54	100
2002-2003	97.99	2.01	100
2003-2004	95.32	4.68	100
2004-2005	90.67	9.33	100
2005-2006	85.75	14.25	100
2006-2007	81.92	18.08	100
2007-2008	69.78	30.22	100
2008-2009	70.92	29.08	100
2009-2010	71.18	28.81	100
2010-2011	69.77	30.23	100
2011-2012	70.68	29.32	100
2012-2013	72.70	27.30	100
2013-2014	75.39	24.61	100

Source: Various Annual Reports of IRDA from 2000-01 to 2013-14

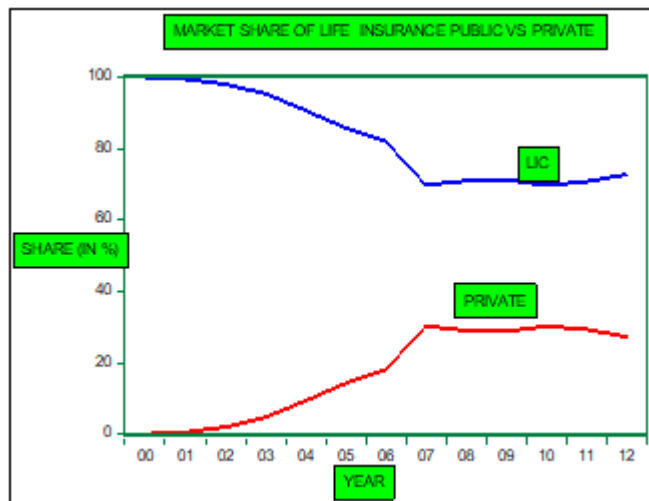


Diagram 2

Market share is one of the important indicators to analyze changes in the insurance sector. Table 5 shows the market share of life insurance industry in the post-reform period, from 2000-01 to 2012-13, the share of public sector (LIC) reduced from 99.98% to 72.70% in 2000-01 to 2012-13. This reduction is due to opening up of the insurance sector to the private and foreign companies. But still the public sector is dominating the life insurance industry. In case of private sector, its share increased from 0.02% in 2000-01 to 30.22% in 2007-08.

However, the market share reduced to 28.81% in 2009-10 due to global financial crisis. It again came down to 27.30% in 2012-13. This shows that there was considerable growth in the insurance business in the private sector during the last 12 years, but for the last two years, declining trend has started and still a big gap remains between the public and private sectors.

Table 6: Total Life Insurance Premium Income sector-wise (2000-2014) (Rs crores)

Year	Type of Business		
	Public (LIC)	Private	Total
2000-2001	34890.02	6.45	34898.47
2001-2002	49821.91	272.55	50094.46
2002-2003	54628.49	1119.06	55747.55
2003-2004	63533.43	3120.33	66653.75
2004-2005	75127.29	7727.51	82854.8
2005-2006	90792.22	15083.54	105875.76
2006-2007	127822.84	28242.48	156065.32
2007-2008	149789.99	51561.42	201351.41
2008-2009	157288.04	64497.43	221785.47
2009-2010	186077.31	79373.06	265450.37
2010-2011	203473.4	88131.6	291604.99
2011-2012	202889.28	84182.83	287072.11
2012-2013	208803.58	78398.91	287202.49
2013-2014	236942.3	77340.9	314283.2

Source: Various Annual Reports of IRDA from 2000-01 to 2013-14.

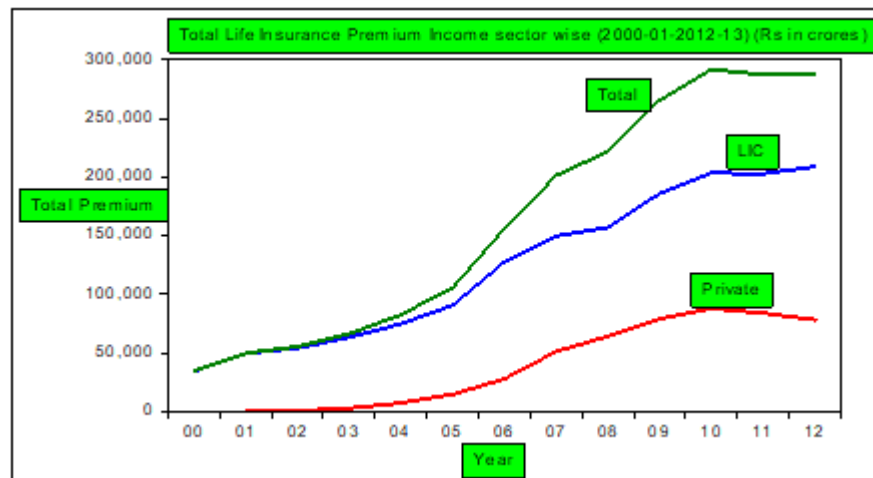


Diagram 3

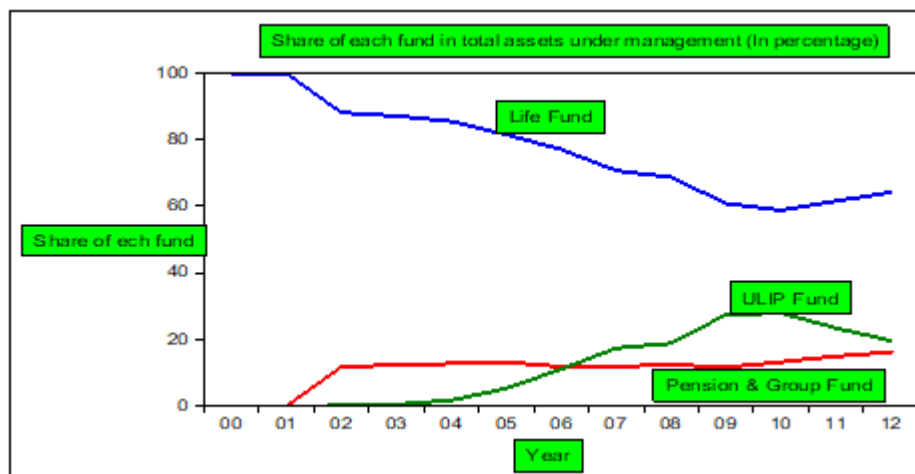
The above table shows the **total Life Insurance Premium Income sector-wise (2000-2013)**. From this table one can easily understand the overall performance of the sector because the total business is measured in terms of the premium income. This is the most important measure in the trend analysis. The business turnover of public sector (LIC) in 2000-01 was Rs 34,890.02 crores, and it reached Rs 202889.28 crores in 2011-12. This means that from 2000-01 to 2011-12 it increased 5.81 times. When it comes to the private sector, in 2000-01 financial year the turnover of the business was Rs 6.45 crores. Then it gradually increased to Rs 84,182.83 crores in 2011-12. In between 2000-01 and 2011-12, it increased 13,051 times because of the low base in the

initial year. But in the year (2012-13) IRDA annual report indicates a declining trend in the both public as well as private sector life insurance industry. Overall premium growth in the private sector was only moderate because, many numbers of private companies are operating; whereas, as there is only one company in the public sector (LIC), they have good business. The private sector has a lot of potential and so it can increase its penetration and can expand its premium base. Overall, the Life insurance industry premium income was Rs 34,898 crores in 2000-01 which increased to Rs 287202.49 crores in 2012-13.

Table: 7. Share of each fund in total assets under management (In percentage)

Year	Life Fund	Pension & Group Fund	ULIP Fund	Total
2000-2001	100	0	0	100
2001-2002	100	0	0	100
2002-2003	88.14	11.76	0.1	100
2003-2004	87.15	12.37	0.48	100
2004-2005	85.48	12.77	1.76	100
2005-2006	81.53	13.15	5.31	100
2006-2007	77.06	11.85	11.1	100
2007-2008	70.71	11.91	17.37	100
2008-2009	68.71	12.44	18.85	100
2009-2010	60.79	11.69	27.52	100
2010-2011	58.81	13.28	27.91	100
2011-2012	61.64	14.97	23.4	100
2012-2013	64.19	16.18	19.63	100
2013-2014	65.81	17.25	16.94	100

Source: Handbook on Indian Insurance Statistics, 2013-14.

**Diagram 4**

The share of assets under management of life insurance industry is as follows: It is mainly divided between, life fund, pension & group fund, and ULIP Fund. The share of Life fund in 2000-01 was 100 % and gradually by 2011-12 it decreased to 61.64% and again increased to 64.19% by 2012-13. The reasons for the reduction in this share are due to more market

orientation of assets, and since then pension & Group share increased from 0 % to 16.18 % during 2000-01 to 2012-2013. Regarding ULIP Fund it grew more rapidly than the pension & Group fund. ULIP fund grew from 0% to 23.40 % over a period of 2000-01 to 2011-2012 and later it exhibited a decline trend. It fell down to 19.63% by 2012-13.

Table 8: Investment Made by Total Life Insurance Industry, 2000-01 to 2013-14(Rs crores)

Year	Central Govt Securities	State Govt & Other Approved Securities	Infrastructure Investments	Approved Investments	Other than Approved Investments (OTAI)	Total
2000-2001	47512.68 (24.49)	52523.95 (27.07)	24886.86 (12.83)	50502.28 (26.03)	18583.83 (9.58)	194009.6 (100)
2001-2002	128813.1 (55.92)	3364.38 (1.46)	20740.87 (9.00)	60928.74 (26.45)	16521.65 (7.17)	230368.74 (100)
2002-2003	139939.3 (53.71)	28492.69 (10.94)	32962.63 (12.65)	52255.25 (20.06)	6902.59 (2.65)	260552.48 (100)
2003-2004	169212.1 (47.99)	38596.03 (10.95)	38636.84 (10.96)	89222.95 (25.30)	16956.56 (4.81)	352624.52 (100)
2004-2005	201549.9 (47.04)	51186.89 (11.95)	45521.01 (10.62)	103020.72 (24.04)	27173.39 (6.34)	428451.91 (100)
2005-2006	238089 (48.87)	58288.17 (11.97)	49638.45 (10.19)	111949.41 (22.98)	29185.68 (5.99)	487150.69 (100)
2006-2007	275098.8 (45.53)	60088.43 (9.95)	69836.78 (11.56)	159644.6 (26.42)	39511.17 (6.54)	604179.81 (100)
2007-2008	296687.5 (38.73)	85198.11 (11.12)	63262.13 (8.26)	257183.14 (33.58)	63638.49 (8.31)	765969.33 (100)
2008-2009	316009.8 (34.49)	107189.59 (11.70)	66673.33 (7.28)	353958.85 (38.63)	72533.26 (7.92)	916364.78 (100)
2009-2010	360446.8 (29.73)	137235.62 (11.32)	85674.54 (7.07)	568752.27 (46.91)	60348.72 (4.98)	1212457.93 (100)
2010-2011	420951.8 (29.43)	173733.34 (12.15)	89180.75 (6.24)	676875.4 (47.33)	69376.25 (4.85)	1430117.57 (100)
2011-2012	468082.4 (29.60)	214515.2 (13.57)	97319.92 (6.15)	731447.35 (46.26)	69893.97 (4.42)	1581258.7 (100)
2012-2013	512180 (29.35)	265989 (15.24)	118878 (6.81)	781539 (44.79)	66308 (3.80)	1744894 (100)
2013-2014	5,18,824 (17.65)	2,55,469 (19.12)	1,55,025 (30.41)	3,29,787 (11.19)	29,117 (40.68)	12,88,224 (15.02)

Source: Handbook on Insurance Statistics India 2013to 14. Note: Figures in brackets indicate the % share of investment in total investments

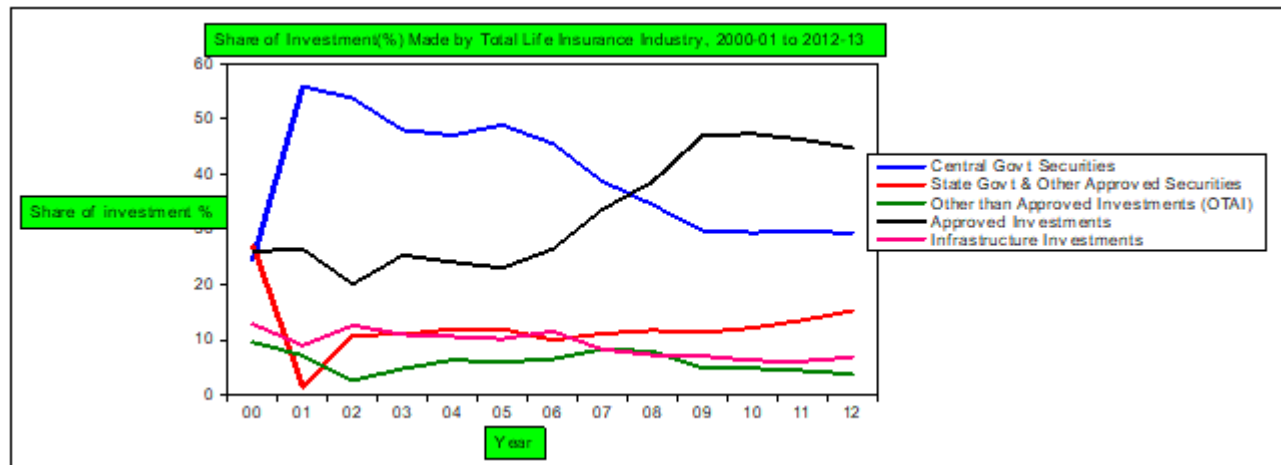


Diagram 5

The above table shows **the investment pattern of Life insurance industry**. Investment pattern and strategy are the crux of the Insurance business because it carries policy holders' money, and it has to repay to the policy holders within the time limit. The investment portfolio consists of Central government securities, State government and other approved securities, investment in infrastructure, approved investments, and other than approved Investments. Central government securities, investment share of total investment was 24.49% in 2000-01, which increased to 53.71% in 2002-03, and then it gradually reduced to 29.35% by 2012-13. Investment on State government and other approved securities share in total investment in 2000-01 was 27.07%, which reduced to 15.24% by 2012-13.

The reasons for reduction in central and state government securities are – reduction in the yield on the securities, portfolio diversification, and IRDA investment rules. The share of investment on infrastructure shares out of the total investment in 2000-01 was 12.83%, and then it reduced to 6.81% by 2012-13, due to investment diversification. Approved investment's share in the total investment in 2000-01 was 26.03%. Then it increased to 44.79% by 2012-13 due to investment diversification and market participation. Other than approved investment's share in the total investment in

2000-01 was 9.58%. Then it reduced to 3.80% by 2011-12. The total investment was Rs 1, 94,009 crores in 2000-01. It grew to Rs 17, 44,894 crores by 2012-13.

Table 9: Number of Offices of Life Insurance industry, 2000-01 to 2013-14

Year	Type of business		
	Private sector	LIC	Total
2000-2001	13	2186	2199
2001-2002	116	2190	2306
2002-2003	254	2191	2445
2003-2004	416	2196	2612
2004-2005	804	2197	3001
2005-2006	1645	2220	3865
2006-2007	3072	2301	5373
2007-2008	6391	2522	8913
2008-2009	8785	3030	11815
2009-2010	8768	3250	12018
2010-2011	8175	3371	11546
2011-2012	7712	3455	11167
2012-2013	6759	3526	10285
2013-2014	6193	4839	11032

Source: Various Annual Reports of IRDA from 2000-01 to 2013-14.

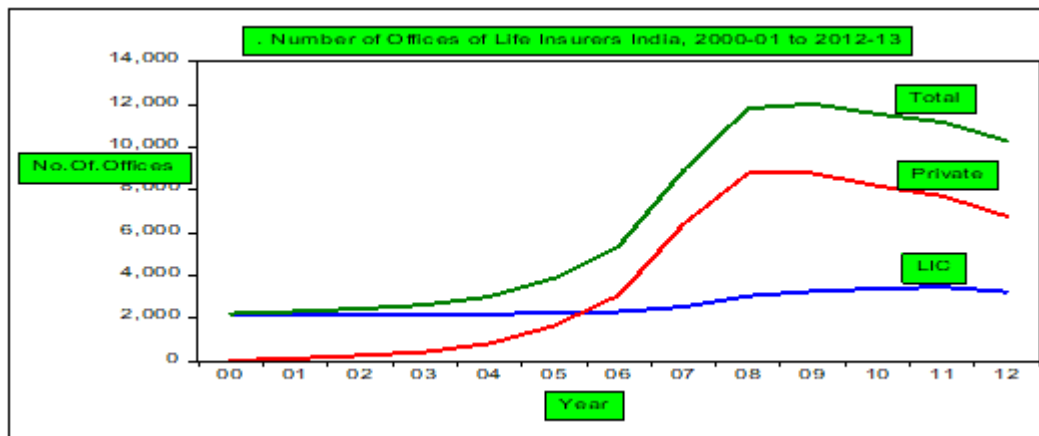


Diagram 6

Table 9 shows the **Number of Offices of Life Insurance Industry in India** in the post-reform period. The reach of insurance to different parts of India can be known through the number of offices established. In life insurance we have public (LIC) and private companies. The number of Private Life Insurance offices available in 2000-01 was 13, which gradually increased to 8175 by 2010-11. It started declining from the last couple of years. Regarding the public sector (LIC), the total number of offices available in 2000-01 was 2186. Since then, it grew to 3455 by 2011-12. LIC also exhibited a declining trend in 2012-13. The total no. of insurance offices of the total insurance industry was 2199 in 2000-01, which expanded to 11,67 by 2011-12 and it recorded low trend in 2012-13. The growth in offices was mainly contributed by the private sector during this study period. Still, it is a long way for the Indian insurance to reach the masses with their products for which they need strong marketing office set up. Establishing of offices, particularly in the rural and semi urban areas is the biggest challenge to the Indian insurance industry.

Table 11: Operating Expenses and Operating Expenses ratio of life insurers (Rs. Crore)

Year	Type of business		
	Public (LIC)	Private	Total
2001-2002	4260.39 (17.62)	419.36(187.5)	4679.75(18.54)
2002-2003	4571.75(17.55)	838.27(85.59)	5410.02(18.90)
2003-2004	5186.49(8.16)	1402.44(44.95)	6588.93(9.89)
2004-2005	6241.26(8.31)	2229.46(28.84)	8470.72(10.22)
2005-2006	6041.55(6.65)	3568.13(23.67)	9609.68(9.08)
2006-2007	7085.84(5.54)	6500.01(23.01)	13585.85(8.7)
2007-2008	8309.32(5.55)	12032.46(23.34)	20341.78(10.10)
2008-2009	9064.29(5.76)	16659.60(23.01)	25723.89(11.60)
2009-2010	12245.82(6.58)	16641.81(20.97)	28887.63(10.88)
2010-2011	16980.28(8.35)	15962.02(18.10)	32942.30(11.30)
2011-2012	14914.40(7.35)	14760.19(17.53)	29674.59(10.34)
2012-2013	16708 (8.00)	14854 (18.95)	31562 (10.99)
2013-2014	237600 (10.03)	13704 (17.72)	37465.41(11.92)

Source: Compiled from the annual reports of IRDA from 2000-01 to 2012-13

Note: Figures within in brackets indicate the operating expenses ratio. Operating expense ratio is the ratio of operating expenses to the premium underwritten by the life insurers.

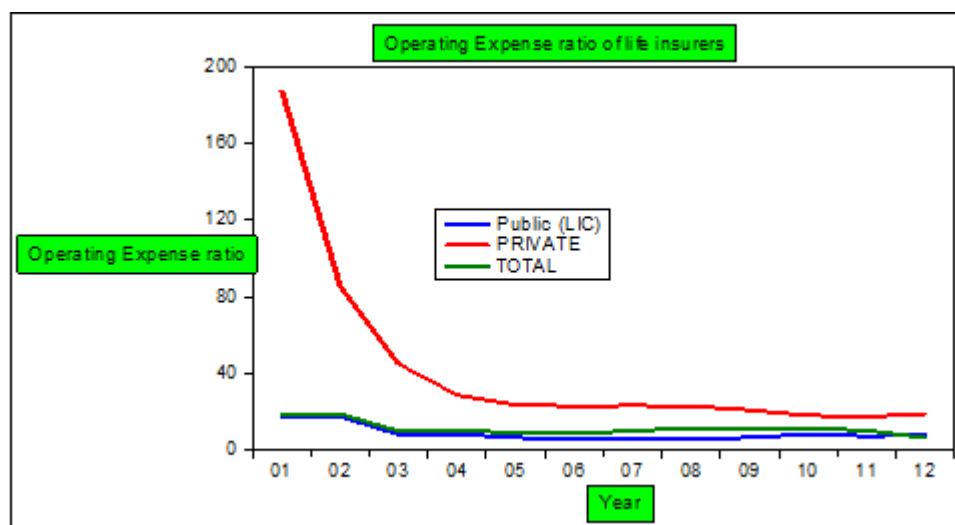


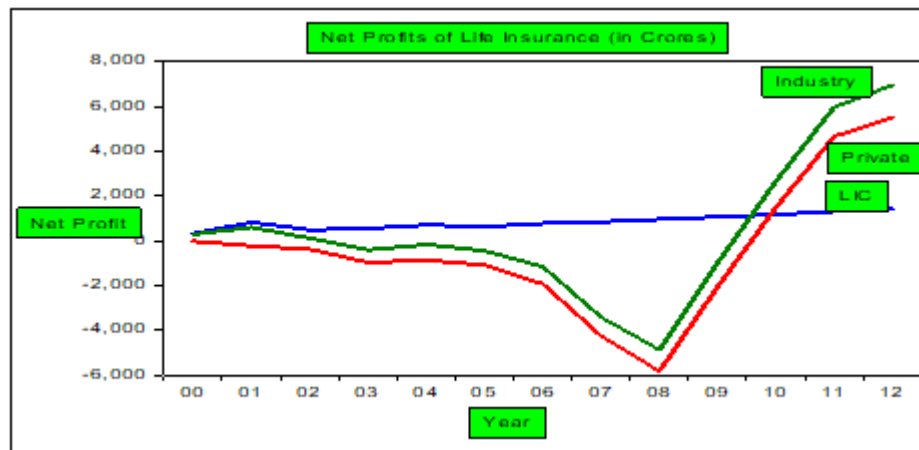
Diagram 7

The above table shows the **Operating Expense and Operating Expense ratio of life insurers in period of 2001-02 to 2012-13**. This is one of the important indicators which tell about the operating performance of a company or an industry. The operating expense ratio of the public sector (LIC) was 17.62 in 2001-02. It decreased to 6.58 in 2009-10 and it came to 8.00 by the year 2012-13. It indicates that the operating efficiency of LIC increased during 2000-01 to 2009-10 and then it started declining. Regarding the private sector, its operating expense ratio was 187 in 2001-02, and 18.95 in 2012-13. The operating expense ratio in case of the private insurers is high, particularly in the first year of operations and started declining gradually. Even then, the private insurers are still continuing their operations. The ratio of expenses to the premium is coming down slowly on account of both stabilization of operations and increase in the premiums. The total operating expense ratio was 18.54 in 2000-01 to 6.42 in 2012-13. It indicates that the operations are stabilizing over a period a time.

Table 12: Net Profits of Life Insurance (in crores)

Year	Type of business		
	Public (LIC)	Private	Industry
2000-2001	316	-25	291
2001-2002	822	-228	594
2002-2003	488	-377	111
2003-2004	552	-967	-415
2004-2005	708	-873	-165
2005-2006	631	-1083	-452
2006-2007	774	-1933	-1159
2007-2008	845	-4257	-3412
2008-2009	957	-5836	-4879
2009-2010	1,061	-2050	-989
2010-2011	1,172	1,485	2,657
2011-2012	1,313	4,661	5,974
2012-2013	1436	1156	2592
2013-2014	1634	1740	3374

Source: Compiled from the annual reports of IRDA from 2000-01 to 2013-Note: Minus figures indicate losses.

**Diagram 8**

Net profit of life insurance is the financial performance indicator of any company, and it explains the overall status of the industry. The net profit of LIC was Rs 316 crores in 2000-01 and it reached Rs 1437 crores by 2012-13; that means it increased by 4.54 times and the LIC did good business during that period. The private sector companies started their operations in 2000-01. The net profit of the private sector was Rs (-) 25 crores in 2000-01. The losses reached Rs 5836 crores by 2008-09 and Rs 2,050 crores by 2009-10. The profit in 2010-11 was Rs 1,485 crores, and in 2012-13 it was Rs 5511 crores.

The insurers are required to inject capital at frequent intervals to achieve growth in premium income. Owing the high rate of commissions payable in the first year, expenses towards setting up operations, rising costs for developing the agency force, creating a niche market for its products, achieving reasonable levels of persistency, providing for policy liabilities, and maintaining the solvency margin would be difficult for the insurers to earn profits in the initial seven to ten years of their operations. Industry net profit in 2000-01 was Rs 291 crores and it reached Rs 6,948 Crores in 2012-13.

It increased by 20.5 times over the period. But from 2003-04 to 2009-10, the private sector was in losses.

Challenges faced by the Indian life Insurance Industry

The period succeeding the opening up the life insurance industry in India to the private and foreign player is very significant. During the period 2000-2011, the Indian life insurance industry combined with India's rapid growth of economy gained its foothold in the country. Private sector insurers ventured into the country and the industry faced the market driven competition, which was much more compared to the time when insurance business was dominated only by public sector insurers. The beginning of this new era in the development of insurance industry saw a proliferation of new products and distribution channels which promoted rapid growth of the industry.

Along with the expansion of the life insurance industry, the industry also faced the pressure of the high upfront cost due to nationwide expansion. It also faced the problem of dwindling volumes as policy lapses are increasing every year. The following are some of the important contemporary issues and

challenges in insurance business which are to be considered seriously.

Low Rural market share:

Low rural and social sector share is a major hurdle for life insurance companies. Even the knowledge of insurance products and information about the advantages of life products is very low in the rural areas.

Low satisfaction of Customer Service:

With both LIC and private players in operation, Indian life insurance market has undergone significant changes over a period of time. One of the major challenges faced by the organizations is the increase in competition, and continuous increase in customer's expectations. As a dissatisfied customer carries out word of mouth publicity, life insurers alongside selling insurance policies should try to keep their customers satisfied.

Delayed Break-even for Private Insurance Companies:

Break-even point is achieved in the insurance industry when the new business premium is equal to the renewal premium. However, as the Indian insurance industry is growing, the volume of new premiums is much more than the renewal premiums. Globally, life insurance companies break even in six to eight years, but in India, it has not been achieved and it may take another one or two years due to the recent financial crisis in the world.

Distributional channel challenge:

India is a diverse country with various languages, food, culture, spending and saving patterns. Historically, the majority of life insurance players has followed a national strategy, with largely similar distribution and operating models across country. Finding niche markets, having the right product mix through add-on benefits and riders, effective branding of products and services and product differentiation will be some of the challenges faced by new companies. Customer expectations and awareness have significantly increased in recent years, particularly in terms of speedy and better service. Reaching the consumer's expectations on par with foreign companies - such as better yield and improved quality of service, particularly in the area of settlement of claims, the issue of new policies, and transfer of the policies and revival of policies in the liberalized market is very difficult.

Distributional channel challenge:

The potential and performance of the insurance sector is universally assessed with reference to two parameters, viz insurance penetration and insurance density. These two parameters are often **used** to determine the level of development of an insurance sector in a country. Life insurance penetration consistently went up from 2.75% in 2001-02 to 4.60% in 2009-10, before slipping to **4.40%** in 2010-11 and further slipping to 3.40% in 2011-12. India has reported consistent increase in insurance density every year since the sector was opened up for private competition in the year 2000. However, for the first time in 2011-12, there was a

fall in insurance density. The life insurance density in India has gone up from USD 9.1 in 2001-02 to USD 49.0 in 2011-12 though it reached the peak of USD 55.7 in 2010-11. From the above, it can be seen that the biggest challenge the Indian life industry is facing today are low density and low penetration, which are low compared to those of advanced countries.

Global Insurance Issues:

There are several important issues on which IRDA is working on - the convergence of the Indian Accounting Standards with the IFRS, the settlement of norms relating to the issuance of IPOs (initial public offers) and M&As (mergers and acquisitions), the establishment of a more robust system to collect and disseminate appropriate insurance related data and several other initiatives are the main issues of global insurance.

Marketing of products through online issues:

Initially, insurance was seen as a complex product and buyers preferred face-to-face interactions with intermediaries. Nowadays, the technology allows insurers to increase their reach into the market. All insurers have websites through which they provide information about products and services. In India Internet penetration is still low and legality of agreements is posing problem. The insecurity associated with transactions over the net is still an inhibiting factor. The internet has not been evolved into a means for direct selling of insurance in the current scenario. In the Indian market, where insurance is sold after considerable persuasion even after face-to-face selling, the selling over the net, which must be initiated by the client, would take some more time.

Regulatory challenge:

The biggest challenge faced by the Government today is that of a regulator with the prospect of about 40 or 50 players (life and non-life), each represented by thousands of agents, brokers and intermediaries. To evolve a free and fair method of assessing the companies, to ensure fair play between the competitors, and to safeguard the interests of largely uninformed customers - are the main tasks ahead. The other and equally serious aspect is to ensure that the vast amounts collected by the insurance and pension funds are utilized for the welfare of the people. Though the Government itself would not be the guarantor of the policy money, nevertheless, it is accountable through its regulatory mechanism to put in place prudential norms of investment and accounting, revenue recognition, fair valuation of assets and liabilities, determining necessary margins towards any contingencies, and proper reserves for shrinkage of investment.

5. Conclusion

The overall trend in the insurance industry has been positive. Global players have exhibited an interest in the huge market that India offers. Given that 42.9 percent of the financial savings are made with the banking sector, there is a vast potential for the insurance sector to grow. Many international studies have estimated that the insurance industry in India can

grow by over 125 per cent in the next ten years. In fact, India has been identified as one of the fastest growing insurance markets. The growth in the life segment is expected to be faster as against the non-life segment.

It is more than one decade of reform period in the Indian life insurance sector, a number of national and international private players (23 private players,) entered the Indian insurance market but LIC is the dominating player in the life insurance sector. In the decade of the reform period, declining trend started in the insurance industry for the first time in 2010-11. In spite of all the positive trends, the globalized life insurance market is still facing a number of challenges as explained above.

On the whole, the study presents a holistic view of the "Indian life Insurance Industry" in an analytical way from its inception in 1818. The study is divided into three parts - first, pre-nationalization period; second, post-nationalization period; and third, post-reform era. In all these three periods, life insurance industry is analyzed by considering various parameters ranging from premium to branch expansion. Based on this analysis, various issues and challenges in the life insurance industry are identified, and these issues were analyzed in a systemic manner by incorporating different arguments existing in the literature and policy circles. Since there are different stakeholders in the insurance industry ranging from companies to customers, effort has been made to incorporate all the different dimensions of the challenges in an unbiased manner.

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Certificate of Presentation



This is to certify that

G. Swaroopa

has presented the paper titled

Emerging Trends and Challenges in Life Insurance Industry in India

*in the 4th International Conference on Applied Econometrics (ICAE-IV)
organized by IBS Hyderabad in collaboration with*

The Indian Econometric Society on March 20-21, 2014


Dr. Trilochan Tripathy
Conference Chair, ICAE-IV


Dr. C S Shylajan
Area Co-ordinator, Economics


Dr. S Venkata Seshiah
Deputy Director, IBS Hyderabad



School of Economics

University of Hyderabad

An Introduction to Data Analysis Using R

(March 04-06, 2016)

Certificate of Participation

This is to certify that Dr. / Mr. / Mrs. / Ms. J. SWARODPA has

successfully completed a **Three Day Workshop on An Introduction to Data Analysis Using R** organized by School of Economics, University of Hyderabad (UoH) in collaboration with the C. R. Rao Advanced Institute of Mathematics, Statistics and Computer Science (CRRAO AIMSCS), held during the period from 04-March-2016 to 06-March-2016.

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School of Economics
University of Hyderabad

Dr. Alok Kumar Mishra
06/03/16
Workshop Coordinator

School of Economics
University of Hyderabad

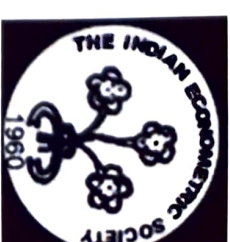
Dr. Alok Srivastava
06/03/16
Course Instructor,

Assistant Professor, CRRAO AIMSCS
University of Hyderabad Campus



Workshop on

Panel Data Econometrics and Its Applications



Certificate of Participation

This is to certify that *Ms. Jetti Swaroopa* has participated in the workshop on *Panel Data Econometrics and Its Applications* jointly organized by the Gokhale Institute of Politics and Economics (GIPE) and The Indian Econometrics Society (TIES) from 7th to 9th January 2015 at Pune.

S. M. Jeyaraj

The Indian Econometrics Society

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K. S. Reddy
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**C R Rao Advanced Institute of Mathematics,
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**National Workshop on
Big Data Analytics for Banking, Insurance and Financial Sectors
2-4, November 2015**

Certificate of Participation

This is to certify that **Jetti Suresh Babu, UoH** has participated in the **National Workshop on Big Data Analytics for Banking, Insurance and Financial Sectors** held during 2 - 4, November 2015 jointly organized by C R Rao Advanced Institute of Mathematics, Statistics and Computer Science (AIMSCS), University of Hyderabad (UoH) and Institute for Development and Research in Banking Technology (IDRBT)

J. Nedim
Smt. Neelima Jampala
Convener

Prof. Allam Appa Rao
Director, AIMSCS