A Behavioral Study of Life Insurance Purchase Decisions

A Thesis

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by

Manohar Giri

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Statement of Thesis Preparation

1. Thesis title: **A Behavioral Study of Life Insurance Purchase Decisions**

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3 Thesis Guide was referred to for preparing the thesis.

4. Specifications regarding thesis format have been closely followed.

5. The contents of the thesis have been organized based on the guidelines.

6. The thesis has been prepared without resorting to plagiarism.

7. All sources used have been cited appropriately.

8 The thesis has not been submitted elsewhere for a degree.

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CERTIFICATE

It is certified that the work contained in the thesis titled "A **Behavioral Study of Life Insurance Purchase Decisions**" by "**Manohar Giri**" has been carried out under my supervision and that this work has not been submitted elsewhere for a degree*

March, 2018

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SYNOPSIS

Name of Student	Manohar Giri
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The insurance market in India is highly concentrated with the Life Insurance Corporation of India (LIC) having more than 70% of the market share. High levels of financial illiteracy lead to significant information asymmetry in the market. Many households lack access to the formal financial sector and do not have bank accounts. In this context, insurance agents are often the only source of information. Insurance is often perceived as an alternative investment option even though the returns from this mode of investing may be less than optimal. A 2014 study estimated that the loss to the consumer from lapsed insurance policies between the years of 2004 and 2011 was about $ 28 billion.

Consumer choice in the insurance sector has been studied extensively in the context of developed economies. Many of these studies assume that consumers make rational choices aiming to maximize their utility under wealth and information constraints. Risk minimization, bequest and investment motives often drive the demand for life insurance. Several authors have noted examples of insurance purchase behavior that are inconsistent with models of rational choice. Behavioral models have been proposed to explain anomalies in consumer behavior that are not explained by the expected utility models.

The aim of the current study is to understand the behavioral aspects of insurance purchase decisions. This thesis studies four different aspects of the insurance market in India. First, we try to develop an econometric model for insurance demand at household level. Second, we

investigate how individual beliefs, attitudes and social norms affect insurance purchase decisions. Third, we look at why individuals choose different types of policies, whether it is term, endowment or multiple policies, and whether this choice meets their individual needs or is led by social pressure. Finally, we look at the reasons that lead to lapsation of policies and whether this is related to the original motive for insurance purchase. The results from both the third and final chapters of this thesis are indicative of possible mis-selling of insurance in India, where individuals may purchase insurance due to social pressures and aggressive selling tactics by insurance agents.

In the first part of the thesis, we study the determinants of household demand for life insurance in India. A unique short panel dataset comprising of 34,855 households surveyed in the Indian Human Development Survey (IHDS) in 2004-05 and 2011-12 was used for this purpose. Socio-economic status, education level of the household head, asset ownership, family composition (households headed by women, family size and child birth) and initiation of a relationship with a bank had statistically significant effects on purchase of life insurance. The main difference among rural and urban households was that financial inclusion (in terms of loans availed and relationship with a bank) affected the former but not the latter.

In the second part of the thesis, the objective was to understand how consumers arrive at the decision to purchase life insurance. The theory of planned behavior (TPB) was the theoretical model used. Following this model, we were interested in seeing how beliefs, social norms, attitudes and perceived behavioral control affect the decisions to purchase insurance. A questionnaire was developed and primary data was collected from 386 respondents from 20 cities and 20 villages of UP, Rajasthan and Uttarakhand and other parts of the country. A structural equation modeling approach was used. Beliefs about insurance and subjective norms were found to be inextricably linked with each other. These and perceived behavioral control affected attitudes towards insurance and attitudes in turn affected purchase behavior.

In the third part of the thesis, we wanted to understand how individuals made choices in terms of the kind of insurance policy they purchase. From survey of the literature, we concluded that there was significant amount of mis-selling of life insurance policies in India. Mis-selling was not only in terms of whether a person should buy insurance but also what kind of policy he or she should purchase. This was the motivation for this part of the study. We wanted to understand the reasons for choosing different kinds of policies. We researched different motives that individuals had for purchasing insurance including (i) tax saving, (ii) saving for future expenses, (iii) bequest for the family in case of untimely death and(iv) social motives such as influence of the insurance agent or bank personnel. Tax savings motives were found to be positively related to the purchase of term policies, while savings and bequest motives were positively related to the purchase of endowment policies. Social influence was the primary motive related to the purchase of multiple policies.

Finally, we investigated the reasons behind lapsation of policies. Lapsation of policies may be due to deterioration of financial conditions, or due to the original reason for insurance purchase becoming irrelevant, or due to the mis-selling of insurance where the policy was purchased under social pressure. The question we tried to address was as follows: What were the original motives for insurance purchase for those policy holders, whose insurance coverage lapsed. Insurance coverage of individuals who were less financially aware and those who were motivated because of social reasons were more likely to lapse within a few years, indicating that it may not have been needed in the first place.

The findings indicate that in India's emerging economy many customers rely on advice from their agents when they decide to purchase an insurance policy. Applying the theory of planned behavior, we find that subjective norms have a significant effect on the decision to purchase insurance. Social influence is also found to affect choice of policies. This may lead to suboptimal decisions where customers may buy insurance policies that do not address their financial needs. There is a need for greater education and awareness programs for consumers in this rapidly growing industry.

Acknowledgements

I have had the friendship and support of many people in my doctoral journey at IIT Kanpur. I take this opportunity to express my gratitude to all of them.

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List of Acronyms

AGFI	Adjusted Goodness of Fit Index
AIC	Akaike Information Criterion
ANOVA	Analysis of Variance
BE	Behavioral Expectation
BI	Behavioral Intention
BPL	Below Poverty Line
CFI	Comparative Fit Index
EFH	Emergency Fund Hypothesis
GDP	Gross Domestic Product
GFI	Goodness of Fit Index
GNDI	Gross National Disposable Income
HDFC	Housing Development Finance Corporation
ICICI	Industrial Credit and Investment Corporation of India
IFI	Incremental Fit Index
IFPS	India Financial Protection Index
IHDS	Indian Human Development Survey
IRDAI	Insurance Regulatory and Development Authority of India
IRH	Interest Rate Hypothesis
LIC	Life Insurance Corporation of India
MLE	Maximum Likelihood Estimation
NCAER	National Council of Applied Economic Research
NCCS	New Socioeconomic Classification System
NLSY	National Longitudinal Survey of Youth
NSHIE	National Survey of Household Income and Expenditure
PBC	Perceived Behavioral Control
PGFI	Parsimony Goodness of Fit Index
PMJJBY	The Pradhan Mantri Jeevan Jyoti Bima Yojana

PMSBY	Pradhan Mantri Suraksha Bima Yojana
PPF	Public Provident Fund
PPP	Probability Proportional to Population
PRH	Policy Replacement Hypothesis
RBI	Reserve Bank of India
RFI	Relative Fit Index
RMSEA	Root Mean Square Error of Approximation
Rs.	Rupees
SBI	State Bank of India
SCF	Survey of Consumer Finances
SEC	Socio Economic Classification
SEM	Structural Equation Modeling
SRMR	Standardized Root Mean Square Residual
TLI	Tucker-Lewis Index
TPB	Theory of Planned Behavior
TRA	Theory of Reasoned Action
ULIP	Unit Linked Insurance Plans
US	The United States
VIF	Variance Inflation Factor
β	Un-Standardized Regression Estimates

Chapter 1. Introduction

1.1 Background

The Indian economy is one of the fastest growing economies in the world with GDP per capita growing at a rate of 7.1% per annum[1]. The country is also experiencing a demographic shift towards a younger population with about 35% of the population being between 15 and 34 years of age[2] in 2017. In the next few decades, unprecedented numbers of young people are expected to enter the workforce, earn and save part of their earnings. India's household financial savings were estimated to be about 8.1% of the Gross National Disposable Income (GNDI), or about $26 trillion in the financial year 2016-17. About a fourth of these savings are invested in insurance[3]. Thus, the insurance sector is large and will grow further in the coming years. Understanding consumer behavior and what influences purchase decisions is important for different players in this industry including regulators and insurance companies.

Life insurance allows individuals to secure the financial future of their families in the event of their own premature death. It also serves the savings and investment needs of individuals who may be unaware of or wary about investing in mutual funds or the stock market. Unlike countries in the developed world, social security or government pension schemes are accessible to only a small part of the population in India. Most people use bank savings, fixed deposits, post office savings and public provident fund (PPF) as instruments for savings and investment. Due to the lack of access to formal financial markets and lack of information and financial literacy, life insurance assumes a critical role in the financial wellbeing of a large part of the society. It is especially important for rural and poorer sections of the society.

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[1] Source: World Bank:
https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?cid=GPD_30&locations=IN

[2] Source: "Youth in India", 2017 report by Ministry of Statistics and Programme Implementation
Government of India, http://mospi.nic.in/sites/default/files/publication_reports/Youth_in_India-2017.pdf

[3] Source: IRDAI annual report 2016-17

Despite recent growth, the life insurance market in India has low penetration rates compared to many other countries. Financial inclusion is one of the primary concerns of policy makers across the world. The World Bank defines financial inclusion as follows: "Financial inclusion means that individuals and businesses have access to useful and affordable financial products and services that meet their needs – transactions, payments, savings, credit and insurance – delivered in a responsible and sustainable way".   It is notable that in the World Bank definition, access to and use of insurance services has been included as an integral part of financial inclusion. Financial inclusion is of particular relevance to a country like India where many millions are financially excluded. The Government of India has introduced several policies to further the goal of greater financial inclusion in 2014 and 2015. The first of these is the Pradhan Mantri Jan Dhan Yojana (PMJDY) that aims to provide basic banking services to more Indians. The Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY) and Pradhan Mantri Suraksha Bima Yojana (PMSBY) introduced in 2015 aim to provide low cost life insurance and accident insurance respectively.

1.2   Research Motivation

The extant literature on life insurance in India is mostly descriptive in nature, with a few empirical studies that have looked at demographic and socioeconomic drivers of insurance demand. Consumer behavior in life insurance market has remained largely unexplored. Given the low levels of insurance penetration and its critical role in increasing financial wellbeing, it is important to understand the life insurance purchase behaviors of Indians. There are several issues that are of interest, the level of financial literacy and awareness, the level of social influence in the purchase decision, understanding the motivations behind the purchase and understanding whether the existing insurance providers are meeting the needs of the consumer. This is the primary motivation for this study.

We discuss below some of the main theoretical and empirical aspects of insurance literature that motivates this study.

1.3   Rational and Behavioral Theories in Insurance Economics

Traditional economic theory assumes that individuals act as rational agents. They evaluate their choices based on the expected utility of the outcomes of these choices and make decisions to maximize their overall expected utility. Behavioral economics on the other hand posits that actual human behavior differs from the rational model of utility maximization (Simon 1982, Thaler and Benartzi, 2002, Kahnemann and Tversky, 1979). The observed departure from rational behavior is attributed to limits to cognitive ability as well as common cognitive biases that are deeply embedded in the human psyche. Madrian (2014) mentions three ways in which these biases work: (i) imperfect optimization; (ii) bounded self-control and (iii) nonstandard preferences. Imperfect optimization (or bounded rationality proposed by Simon, 1957) indicates that human beings have limited ability to process the information available to them. This may be due to lack of time, knowledge, cognitive ability and presence of distractions. Bounded self-control refers to the fact that even if one understands what they need to do, emotional or psychological barriers may cause behavioral intentions not leading to actual behavior[4]. Nonstandard preferences refer to the fact that people have different preferences that are influenced by their beliefs and values, as well as social norms and cultural factors. Their preferences also change with time and depend on their circumstances at a given point of time and the frame of reference of their decision making.

These three factors are particularly relevant in understanding how decisions related to personal financial management may not follow rationality. The first factor, "bounded rationality" is relevant because financial concepts are considered to be difficult to comprehend. Levels of financial literacy is low even among educated individuals (Lusardi and Mitchell, 2009; Hung *et al.*, 2009; Huston, 2010). Insurance is a sophisticated instrument for risk reduction and requires a high level of financial aptitude and knowledge for the consumer to be able to make intelligent choices. Much of the knowledge about insurance is based on word of mouth or advice given by insurance agents.

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[4]For example, obese people may not be able to stop themselves from eating, smokers may not be able to quit smoking and individuals may not study before an exam or save for the future.

The second factor, "bounded self-control" affects financial decisions in the following way. The level of prudence in the overall population is low, procrastination is high and self-control is limited when it comes to financial planning (Thaler and Shiffrin, 1981; Akerlof, 1991; Charupat and Deaves, 2004; Lusardi, 2008). Since insurance is related to planning for the future and not enjoying in the present, many consumers think of it as a "necessary evil" and do not engage with it actively.

The final factor that affects rational choices is "nonstandard preferences" and differing value systems. These result in an individual's behavior departing from so called "rational" behavior. Individuals may differ in their beliefs and values. They may behave in a way that may not be best for them individually but adheres to social norms and expectations. This would maximize the groups' wellbeing but may not maximize an individual's utility.

Given the low levels of financial literacy in India, the monopolistic nature of the insurance industry till recently, collectivistic culture and the newly found affluence of the young Indian adults, insurance purchase behavior may differ from other countries. Further, given the widely reported mis-selling of insurance in the Indian context and elsewhere, it is necessary to understand whether individual decisions reflect such mis-selling. This is the focus of this study.

1.4   Evolution of the Life Insurance Sector in India

The insurance sector in India was under public ownership until late 1990s. With the liberalization of the insurance sector, the Insurance Regulatory and Development Authority Act (IRDA) was passed in the year 1999 to regulate and promote the insurance industry in India. Insurance Regulatory and Development Authority of India (IRDAI) was set up as a statutory body to regulate Indian insurance and re-insurance market and to protect the interest of its stakeholders. The Indian insurance sector was further liberalized in the year 2015 with Insurance Law (Amendment) Bill 2015 and Foreign Direct Investment (FDI) limit was increased from 26% to 49%. Today, the life insurance market in India is one of largest in the

world both in terms of total premium expenditure as well as number of policies sold. In insurance business India is ranked 10th among 88 countries[5].

The Indian life insurance market has been a monopoly with the Life Insurance Corporation of India (LIC) being the only provider of insurance till the year 2000. After 2000, the market was liberalized and private player were allowed to enter the market. At present there are 24 life insurance companies[6] registered in India. Among these, Life Insurance Corporation of India (LIC) is the only public-sector company. Even though there are larger number of private players in the market, Life Insurance Corporation of India (LIC)is the single largest insurance provider with about 71.8% of the market share. LIC operates through a large network of sales agents. By the end of the year 2016-17 LIC had 1.13 million agents, the corresponding number for private sector insurers was 0.96 million. LIC has a unique position in Indian market as it is considered as the most trustworthy life insurance provider in the country. As per the IRDA, the insurance market in India was about Rs. 328,000 crores (or about $48 billion) in terms of the premiums collected. ICICI Prudential, SBI Life Insurance and HDFC Standard Life are the largest private sector players catering to about 15% of the market together.

1.5 Research Questions Addressed in this Study

The primary focus of this research was to understand decisions to purchase insurance from a consumer behavioral perspective. Four studies have been conducted to understand the life insurance purchase behaviors among Indians. These four studies are based on the following four themes: (i)understanding the effect of several socio-economic and demographic factors on life insurance demand, (ii) understanding the process of life insurance purchase decision using the theory of planned behavior, (iii) the effect of different purchase motives on choice of different kinds of life insurance products and (iv) the effect of purchase motives on life insurance policy lapse.

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[5] Source: IRDAI annual report 2016-17

[6] Source: http://www.policyholder.gov.in/indian_insurance_market.aspx

The first of the research questions was to understand how different *socio-economic and demographic factors* affected insurance purchase or insurance discontinuation. A large secondary dataset from the Indian Human Development Survey (IHDS) covering about 35,000 households across India over two-time periods (2004 and 2011) was used for this purpose. This included information about several household characteristics including income, consumption, age, gender and education of household head and banking relationships. A dynamic logistic regression model of changes in insured status was built by identifying households that had acquired insurance and households that had discontinued insurance coverage. The results provide an overall view of insurance demand in India.

The second theme was related to understanding the *behavioral intention* of would be insurance purchasers. The theoretical basis for this study was the Theory of Planned Behavior. The beliefs, attitudes, subjective norms and perceived behavioral control of the insurance consumers were the latent constructs that were measured using a questionnaire designed for this purpose. Primary data was collected from a sample of about 386 individuals spread over 20 villages and 22 cities in north India. Confirmatory factor analysis and structural equation modeling was used to build the behavior intention model.

The third theme was related to understanding the determinants of the *choice of insurance policy* between term, endowment and multiple policies. The socio-economic and demographic factors that affected this choice were modeled using logistic regression. Motives for purchasing insurance were included in another logistic model. Our primary interest was to understand whether the motives for taking insurance affected the choice of policy and logistic regression models were built for this purpose.

The final theme that we explored was related to the *lapsation of the policy*. Primary data was collected from the respondents on whether their insurance coverage had ever lapsed and if so, what were the reasons for such lapsation. Descriptive analysis of the reasons yielded insights into the most frequent r4easons for lapsation of insurance. Further we built logistic regression

models to understand whether the original motives for purchase of insurance as well as the kind of insurance purchased had an effect on the probability of lapsation of the insurance coverage.

1.6   Outline of the Study

The thesis is presented in 6 chapters. The four themes described above have been elaborated on and results have been presented in Chapter 2, Chapter 3, Chapter 4 and Chapter 5. These chapters include a brief background of the study, literature review, research motives, research design, data and sample, findings and discussion. Chapter 6 summarizes the overall findings of the thesis, giving an overview of the contributions of this thesis and the social implications. Limitations of the work and scope for future research have been discussed in Chapter 6.

Chapter 2. Socioeconomic and Demographic Factors Affecting Changes in Demand for Life Insurance

2.1 Introduction

Life insurance has low penetration among Indian households, with insurance premiums accounting for about 2.72 % of GDP[7]. Due to lack of access to formal financial markets and low levels of financial literacy many Indian households do not effectively plan their financial future. With an increasing emphasis by the government towards greater financial inclusion of all sections of the society, it is important to understand how socio-economic and demographic aspects of rural and urban households affect their decisions to acquire or discontinue life insurance coverage.

Though life insurance is primarily a means of mitigating financial risks associated with premature death, it is mostly used as a tool for savings and investment through endowment policies in India. Social security or government pension schemes are accessible only to a small part of the population. Indian households often depend on informal social support networks for risk mitigation rather than the formal life insurance sector. This social support may not be available equally to all sections of the society. Hence, life insurance assumes an important role in ensuring the financial well-being of a large section of the population.

One of the interesting aspects of life insurance industry in India is the prevalence of a wide network of insurance agents, many of them employed by the largest life insurance company (Life Insurance Corporation of India, LIC)[8]. These agents are often drawn from within the local

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[7]Insurance penetration rate is the ratio of the total insurance premium as percentage of the GDP. Assocham Report https://www.ibef.org/industry/insurance-sector-india.aspx

[8] Life Insurance Corporation of India (LIC) is the largest provider of life insurance with a market share of 70%. It has a large network of LIC agents, who often sell insurance in their private capacity in addition to holding other jobs or occupation.

population and serve a large population of financially unsophisticated customers in pursuing their financial goals. Most life insurance policies sold in India are not term-life policies but rather investment-linked policies, usually with modest returns. Since life insurance is used for risk cover as well as a means of savings and investment, its demand depends on the changing financial resources and needs of a family.

While there is significant mis-selling of life insurance (see Halan *et al.* (2014)), investment-linked life insurance policies do serve a useful role in Indian society by providing access to investments with a reliable institution, protection of these investment plans and premiums from the exigencies of daily life as well as demands from extended family members.

Empirical studies in the research literature of insurance demand in households have typically used cross-sectional data. There are few studies that have looked at the temporal changes in life insurance demand within the same household. Models based on data that track changes in insured status within the same household might avoid the problem of omitted variable bias and provide an insight into the dynamic determinants of insurance demand.

With that aim, in this study, we attempt to study the *changes* in demand for life insurance within the same household over time. We use a short panel dataset from the Indian Household Development Survey which includes 1503 villages and 971 urban neighborhoods across the country, surveyed in 2004-05 and 2011-12. We are interested in both the acquisition as well as the discontinuation of life insurance coverage. We build logistic regression models to estimate the probability of uninsured households acquiring life insurance, and of insured households dropping life insurance coverage.

We also build models to understand the factors that affect the total expenditure on insurance by a household. While we did not have access to the policies bought and the coverage under these policies, we did have data for total expenditure on insurance premiums. This gives us an idea of the differing demand for insurance in different households.

Socio-economic factors such as the socio-economic status of the household, changes in financial conditions, financial inclusion (such as getting a bank account or taking a bank loan); as well as demographic factors such as gender of the household head, education levels of the head and increase in family size are found to be correlated with the probability of acquiring or discontinuing life insurance. Urban households tend to have a larger probability of acquiring life insurance than rural households. However, the effect of financial status on insured status is stronger in rural households than in urban households.

2.2   Literature Review

Consumer choice in the life insurance sector has been studied extensively in the last five decades. Studies have examined various factors, including socioeconomic, demographic and psychographic factors that might affect life insurance demand. In this section, we discuss some of the more recent empirical papers that have looked at socio-economic and demographic determinants of insured status.

Several studies look at macroeconomic variables that may affect the demand of life insurance. These studies give an insight into the aggregate demand for insurance in entire economies. However, they do not provide an insight into factors affecting decision making by individuals or households. A review of 13 such macro-econometric studies is given by Schlag (2003). We do not include these studies in the following literature survey because while they provide an aggregate view of the market, they do not shed light on the large variations among different sections of the society within a given country.

Zietz (2003) presented a comprehensive and detailed survey of the empirical literature over five decades. Among the papers that she reviewed, age, income, education, marital status, family size and occupation were among the most significant determinants of life insurance demand. Higher levels of income and education as well as family size were mostly found to be positively related, while the life insurance premiums and having other avenues of social security were negatively related to life insurance demand. Zietz also pointed out that some of

the studies found conflicting and contradictory results for certain determinants of life insurance demand such as age and family size.

For Germany, Hecht *et al.* (2010) found that marital status, number of children, financial literacy and number of dependents all have a positive impact on life insurance demand. Ulbinaite *et al.* (2013) showed that demographic characteristics and socioeconomic factors have a significant impact on life insurance purchase decisions in Lithuania. They found that families without children take into account a wide range of factors for choosing a life insurance policy and families with children consider only a few factors.

In Malaysia, Annamalah (2013) found that income and education are positively related to life insurance demand while age, number of children, occupation and working spouse were found to be insignificant. Arun *et al.* (2012) found that participation in micro life insurance is positively correlated with the number of children or dependents in the household indicating a possible bequest motive. They also found that financially better off households participate more in micro-life insurance than their poorer counterparts.

In the Indian context, individual characteristics of life insurance policy holders and choice of life insurance products have been the main focus of the research on life insurance purchase. Bodla and Verma (2007) found that middle-aged individuals dominate the rural life insurance market; insurance sales agents are important sources of information and influencers for taking life insurance; and a money-back policy is the most preferred policy in rural areas, followed by endowment policies.

Kakar and Shukla (2010) used NSHIE[9]and IFPS[10]data for 2004-05 and built logistic models for a cross-section of Indian households to understand factors affecting life insurance demand. This

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[9] National Survey of Household Income and Expenditure, a household survey sponsored by the National Council of Applied Economic Research (NCAER) that collected data about demography, employment, income, consumption and ownership details for a large randomly chosen sample of households across India. The first NSHIE survey was conducted in 2004-05 and the second survey was conducted in 2011-12.

study used both directly measurable variables (from NSHIE data) as well as latent traits such as attitudes towards future financial security and propensity to save etc. (from IFPS data). They report that insured households tend to be well off economically, have higher levels of education, have a chief earner who is salaried, and tend to be more optimistic about their financial future. Our work differs from Kakar and Shukla (2010) in that we do not use latent traits, and in that our data is for two different points of time, i.e., we are able to follow and model changes in insured status of individual households.

Several studies have used a static framework to understand variances in demand for life insurance across individuals and households. Few studies have looked at changes in life insurance demand by the same individual or within the same household. We cite two such studies below.

Liebenberg *et al.* (2012) used panel data from the Survey of Consumer Finances (SCF) with data over the period of 1983-89. They found a significant relationship between life events and life insurance demand. In particular they found that events such as marriage, birth of a child, starting a new job and income growth are positively related with acquiring a life insurance policy or increasing coverage on previously purchased policy. Death of spouse, separation and becoming unemployed contribute toward terminating life coverage.

Heo *et al.* (2013) used data from the 2004, 2006 and 2008 National Longitudinal Survey of Youth (NLSY) 1979 cohort in the USA and found that an increase in net worth was associated with increases in life insurance consumption. They also found that women and black individuals increased their life insurance consumption over the period of the study. Finally, they concluded that life insurance acts as a complement to rather than a substitute for wealth.

As explained by Liebenberg *et al.*, dynamic analysis may provide a deeper and better understanding of life insurance purchase decisions. There has been no such study in the context of India or any other emerging market. This motivates our present approach.

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[10] IFPS stands for India Financial Protection Index, in which NCAER partnered with Max New York Life to understand the savings and investment patterns of Indian households.

2.3   Motivation for Research and Research Questions

As can be seen from the review of the literature, there are not many studies (none in India) that have looked at changes in insured status within the same household. While Liebenberg *et al.* (2012) built a dynamic model of insured status; their focus was primarily to see how changes in life events (such as marriage, new child, divorce, death etc.) affected changes in insured status.

However, in the present study the aim is to include different socio-economic as well as demographic factors (such as education and household composition) to understand the factors that affect changes in insured status within the same household observed over two different periods. Given that the socio-economic and demographic characteristics of rural households differ a lot from urban households, we built different models for acquisition and discontinuation of life insurance coverage and the insurance expenditure for these two categories of households[11].

Research Questions:

We were interested in the following questions:

1. Does the age of the household head affect the household's probability of being insured?

Literature suggest that age has a positive effect on life insurance demand (Berekson, 1972; Truett and Truett, 1990 and Showers and Shotick, 1994). We expect household head's age to have a positive impact on life insurance acquisition while negative on life insurance discontinuation.

H1: Household head's age has a positive impact on life insurance acquisition

H1: Household head's age has a negative influence on life insurance discontinuation

2. Does the education of the household head affect the household's probability of being insured?

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[11] In preliminary research work, we built a common model for both rural and urban households but found that separating these categories yielded models with better fit. The rural and urban models also highlighted different independent variables that affected life insurance ownership in the two different scenarios. Hence, here we just present the final results.

If the head of the household is more educated, than they are expected to have greater information regarding the benefits of life insurance and hence are expected to have higher probability of acquiring life insurance (Burnett and Palmer, 1984; Truett and Truett, 1990; Brown and Kim, 1993).

H3: Education of the household head has a positive impact on life insurance acquisition.

3. Does gender of the household have any effect on life insurance acquisition?

Literature suggest that females buy less insurance than males (Gandolfi and Miners, 1996), we also expect females to be less likely to purchase insurance as compared to males.

H4: Households with a male head are more likely to buy life insurance than households with a female head.

4. Does place of residence of the household affect the probability of being insured?

Households in urban areas have greater awareness of financial products, greater levels of financial inclusion and better reach to financial intermediaries and hence are more likely to purchase insurance as compare to rural households.

H5: Urban households are more likely to purchase insurance as compare to rural households.

5. Does socioeconomic and financial status of the household affect the demand for life insurance?

Households with higher SEC status are financially well off and hence can afford insurance premiums. We expect households with higher SEC status to have higher probability of acquiring life insurance and low probability of discontinuation.

H6: Households in higher SEC have higher probability of buying life insurance and low probability of discontinuation.

Households acquiring BPL card as well as falling in poor category have greater need of life insurance but due to lack of access to financial institution and also due to financial constraints we expect them to have lower likelihood of life insurance acquisition.

H7: BPL acquisition has negative effect on life insurance demand.

H8: Poor households are less likely to buy life insurance.

6. Does financial inclusion have any effect on life insurance acquisition and discontinuation?

We have used bank account and bank loan as proxies for financial inclusion. Households with greater financial inclusion will have greater trust in the financial institutions and also, they are more likely to have good relationship with financial intermediaries. We expect these household to have higher probability of acquiring life insurance.

H9: Acquiring new bank account positively affect life insurance demand.

H9: Getting a bank loan has positive effect on the probability of acquiring life insurance.

7. How does life events effect life insurance decisions?

As it was found in the previous study on life events by Liebenberg (2010), households with newly born children and newly married household heads are more likely to acquire life insurance policies. We are also expecting similar results in our study.

H10: Birth of a child in the family positively affects the demand for life insurance.

H11: Households with newly married heads are more likely to acquire life insurance.

2.4   Research Methodology

2.4.1   Data

The data used in this research was collected by the National Council of Applied Economic Research (NCAER) through the Indian Human Development Survey (IHDS). As per the description of the data that is available from the IHDS website, the data represents a multi-topic survey of 1503 village and 971 urban neighborhoods across India. The first round of survey was conducted in 2004-05 and included 41,554 households. In the second round of the survey

most of these households were re-interviewed in 2011-12. However, with the addition of some new households the second round includes 42,152 households.

The survey gathered information on a wide range of socio-economic topics including family structure, poverty, employment, income, consumption expenditure, ownership pattern, and fertility data and so on. The rural sample was drawn using stratified random sampling and the urban sample was a stratified sample of towns and cities within states selected by probability proportional to population (PPP).

Since we are interested in dynamic rather than static factors affecting insurance demand, the availability of short panel data is particularly useful for our purposes. After identifying missing data, we include 34,885 households that were surveyed in both time periods. In order to understand the changes in household characteristics that might be correlated with acquisition or discontinuance of life insurance coverage, we also created several derived variables from the raw data, indicating changes in financial condition, changes in relationships with banks, loans taken, as well as changes in the family structure such as a newly married, or birth of children.

2.4.2 Data Preparation for the Analysis

Datasets of the two household surveys (IHDS-I and IHDS-II) were merged in order to capture the changes in the socioeconomic and demographic characteristics of the households. A short panel dataset was prepared after merging the two separate datasets using unique household IDs. The two period short panel data had 40018 households interviewed in both surveys viz. 2004-05 and 2011-12. After removing households with missing data, the final dataset included 34855 households. Several derived variables were created using the two period panel data to measure the changes in socioeconomic and demographic conditions of the household during the two survey periods. These have been described below.

2.4.3 Specification of the Logistic Model

As our dependent variables are binary and discrete, we use a logistic regression model. The logistic model can be specified as follows:

$$P(Y = 1|X) = f(X_1, X_2, \ldots \ldots, X_n) = \frac{1}{1+e^{-(\beta_0+\beta_1 X_1 + \cdots +\beta_n X_n)}}$$
<div align="right">Equation (2.1)</div>

This can also be expressed as:

$$Logit(p) = log\left[\frac{p}{1-p}\right] = \beta_0 + \beta_1 X_1 + \cdots + \beta_n X_n$$
<div align="right">Equation (2.2)</div>

where β_0 is the intercept, X_i are a set of predictor variables, and β_i are the regression coefficients associated with the ith predictor. In the above, p is the probability of a change in life insured status and $\frac{p}{1-p}$ is known as the odds ratio. β_i gives an estimate of change in the log-odds associated with a unit change in the predictor variable. The parameters in the model are estimated using the method of maximum likelihood estimation (MLE).

2.4.4 Definition of Dependent Variable

Model 1 - Buying Life Insurance: In order to investigate the factors affecting life insurance acquisition, we consider only those households that *did not* have life insurance policies during the first survey period. There were 27599 households that met this criterion. Among these there were 20354 rural and 7245 urban households. Of these households, some households acquired a life insurance policy by the second-time period and some households did not. In order to understand acquisition of life insurance we build different models for rural and urban households for which the dependent variable was defined as the *probability of a household transitioning from "not-insured" to "insured" status over time*.

Model 2 - Discontinuation of Life Insurance Coverage: For life insurance discontinuation, we consider those households that *did* have a life insurance in the first year. This led to a smaller sample of 7286 households, with 3633 rural and 3653 urban households. Among these

there were some that continued to carry life insurance policies in the second period, and some other households that no longer had life insurance coverage in the second period[12]. We build two different models for rural and urban households with the dependent variable defined as *the probability of a household transitioning from "insured" to "non-insured" status*.

Model 3 - Amount of Insurance Expenditure by a Given Household:

We had access to a variable that gave the total amount of expenditure for insurance for a given household. There were 4737 rural households and 3971 urban households. We built separate models for urban and rural households using cross-sectional data for 2011, since this was more recent. For these households, the log of the expenditure on insurance premiums was taken to be the dependent variable[13].

Table 2.1 Characteristics of Households Included in the Sample

	2005		2011	
	Rural	Urban	Rural	Urban
Uninsured	20895	6704	18333	6287
Insured	3877	3409	5654	4611
Uninsured households that acquired life insurance in 2011	---	---	3727	2201
Insured households that dropped life insurance in 2011	---	---	1706	1243
Households that had life insurance in both years	---	---	1927	2410

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[12] The absence of life insurance coverage in the second period may be due to several reasons: an insurance policy may have reached maturity, the insured person may have died, or the insured person may have taken a decision to discontinue the policy. In our data, we do not have access to these specific reasons. Hence our second research question only points to the factors that lead to a previously insured household not having life insurance coverage in the second period.

[13] We did not build models for *changes in expenditure* on insurance premiums unlike the previous models where we tracked the *changes in insured status*. This is for the following reason. Premium rates may have gone up from 2005 to 2011. Changes in expenditure may be due to changes in insurance premiums rather than the quantity of insurance bought.

2.4.5   Independent Variables

Independent variables include both raw variables that were directly taken from the original dataset, as well as derived variables based on the raw data as described below. Some of the independent variables described the initial socioeconomic status of the household while others looked at the change in status in the period between 2005 and 2011.

Raw variables:

a.   Financial Condition-Household income

b.   Demographic factors - age, gender of the head of the household, education of head of household, urban/rural, family size

Derived Variables:

c.   SEC Status: The Government of India has adopted a new Socioeconomic Classification System (NCCS) that classifies households into different socio-economic classes based on two primary variables, the education of the head of the household and the number of durables present in the household. This has been further explained in Appendix-B. Due to possible under-reporting of income by households to avoid tax liabilities, the SEC system is considered to be a more reliable way of evaluating the socio-economic standing of a given household.

We classified each household in our dataset into one of 12 SEC categories based on the raw data in the survey that indicated the education of the head of the household and the kind of assets that the household owned. We created two categorical variable variables namely SEC05 and SEC11 which represent the status of the household's socioeconomic class in the year 2004-05 and 2011-12 respectively.

d.   Change in SEC Status: We have created a categorical variable SEC_IMP which takes a value of 1 if household has moved to a higher SEC grade in 2011-12 as compared to 2004-05, a value of 2 if household has moved to a lower grade and 0 otherwise.

e. Percent change in income between 2004-05 and 2011-12

f. Acquired "Below Poverty Line" (BPL) ration card – the Government of India follows a public distribution system which provides subsidized food and other essentials to poor households. Criteria for getting such ration cards differ from state to state but typically households having annual income less than Rs. 10000 or about $153 per month.

g. Poor –Even though we had data for BPL card status, we created an indicator variable for poverty based on the consumption expenditure reported by a household because of reported misuse of BPL cards[14]. Applying the criteria set by the Rangarajan report in 2014, we defined a household as "Poor" if its monthly per capita consumption expenditure was below Rs.972 in rural and below Rs.1407 in urban areas.[15]

h. Acquired bank account – it takes a value of 1, if the household did not have bank account in first survey but had a bank account in second survey and 0 otherwise.

i. Acquired bank loan – this is equal to 1, if the household did not take bank loan in first survey and reported a bank loan in second survey, 0 otherwise.

j. New child – this is equal to 1 if there was an increase in the number of children in the household in 2011-12 survey and 0 otherwise.

k. Newly Married   - this takes a value of 1 if household head was unmarried in first survey and reported a married status in second survey, 0 otherwise.

l. Change in family size- this measures the percentage change in the number of family members from 2004-05 to 2011-12.

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[14] Notionally, the BPL card is given to households who are below the poverty line. However, as reported by Ram *et* al. (2009), about two-fifths of the BPL cards are with non-poor households. Meanwhile many households in abject deprived households do not have access to BPL cards. Thus, we felt that a derived variable may be more reliable indicator of poverty.

[15]Rangarajan Report on Poverty, 2014,
http://pib.nic.in/newsite/PrintRelease.aspx?relid=108291

m. Urban - the dummy variable indicated whether the household was located in an urban or rural area. This variable was used in the combined model - just to see the effect of location on insured status.

2.4.6   Model Specification:

The model for changes in insured status is specified as:

$$P(Y = 1|X) \sim f(LN(INCOME05) + PER\_C\_INCOME + HEADAGE11 + HEADSEX11 +$$
$$HEADEDUCATION11 + FAMILY\_SIZE\_CHNG + URBAN11 + NMARRIED +$$
$$WIDOWED + NEWCHILD + POOR + ACQUIRED\_BPL + ACQUIRED\_BANK\_AC +$$
$$ACQUIRED\_BANK\_LOAN + SEC05 + SEC\_IMP \qquad \text{Equation (2.3)}$$

where

Y=1 indicates a household that not having life insurance in 2005 acquiring it in 2011 (buy)

Y=1 indicates a household having life insurance in 2005 not having it in 2011 (discontinuation)

The linear regression model for the amount of expenditure on insurance was specified as:

$$Amt\_Ins \sim f(LN(INCOME11) + LN(CONSUMPTION11) + HEADAGE11 +$$
$$HEADSEX11 + HEADEDUCATION11 + NPERSONS + NCHILD + MARITAL\_STATUS +$$
$$POOR + BPL + BANK\_LOAN + SEC11) \qquad \text{Equation (2.4)}$$

where

Amt_Ins = Expenditure on insurance by households in 2011 and the independent variables depicted the household socioeconomic and demographic characteristics in 2011.

2.4.7 ANOVA of Models to Capture Effect Size

We are primarily concerned with the magnitude or the effect size of the variables on the probability of a household acquiring life insurance. We are also interested in the overall effect of a particular class of variables (for instance all variables related to the financial condition, or all variables related to the family structure, etc.) rather than coefficients for individual variables. In order to understand the relative contributions of these groups of variables, we perform ANOVA of models using the nested model methodology (see for instance, McCullagh 1984). The formula for residual deviance of the full model and nested model is given below.

$$Residual\ Deviance\ of\ full\ model = 2(log\ Ls - logLf) \qquad \text{Equation (2.5)}$$

$$Residual\ Deviance\ of\ nested\ model = 2(log\ Ls - logLn) \qquad \text{Equation(2.6)}$$

$$\Delta Deviance\ = (Residual\ devance\ of\ full\ model$$
$$- Residual\ deviance\ of\ nested\ model)$$

$$= 2[(log\ Ls - logLf) - (log\ Ls - logLn)]$$

$$= -2(logLf - logLn) \qquad \text{Equation (2.7)}$$

Where log Ls, $logLf$ and $logLn$ are log likelihoods of saturated model (a model with a parameter for each data point), full model and nested model respectively.

For ANOVA analysis, we built several nested models, where a block of variables related to one characteristic was removed. We used change in residual deviance, i.e. the difference between the residual deviances of full model and nested model to quantify the effect size of a particular category of variables. The greater the difference, greater is the effect size.

2.5 Results and Discussion

We first look at some of the descriptive statistics related to the data in our sample.

SEC Categories: The percentage of rural and urban households in different SEC Classes in 2005 and 2011 has been given in Table 2.2. For better comparison between the two years, the percentage of insured households in different SEC categories in 2005 and 2011 is depicted in Figure 2.1. The corresponding percentages for urban households are given in Figure 2.2.

Table 2.2 Number of Rural and Urban Households with Life Insurance Percentages

SEC GRADE	2005				2011			
	Rural – # House holds	Rural Insured %	Urban – # House holds	Urban Insured %	Rural – #House holds	Rural Insured %	Urban - #House holds	Urban Insured %
E3	2550	3.5%	304	4.6%	1078	4.2%	144	6.9%
E2	4819	4.7%	503	6.2%	2618	6.8%	235	6.4%
E1	6127	8.0%	1267	9.6%	4201	10.8%	566	11.3%
D2	4218	14.4%	1555	17.1%	3976	15.0%	1029	17.2%
D1	2552	21.7%	1478	24.6%	3408	21.3%	1289	25.4%
C2	1335	28.2%	1013	34.5%	2627	28.9%	1449	32.6%
C1	1271	38.2%	1036	44.0%	2380	37.7%	1621	40.5%
B2	805	50.4%	941	49.8%	1259	43.9%	1210	49.4%
B1	590	54.6%	885	61.1%	1136	53.6%	1119	59.8%
A3	400	63.0%	722	68.7%	1005	60.6%	1398	68.9%
A2	92	67.4%	341	71.6%	276	75.7%	721	77.4%
A1	13	53.8%	68	85.3%	23	73.9%	117	86.3%
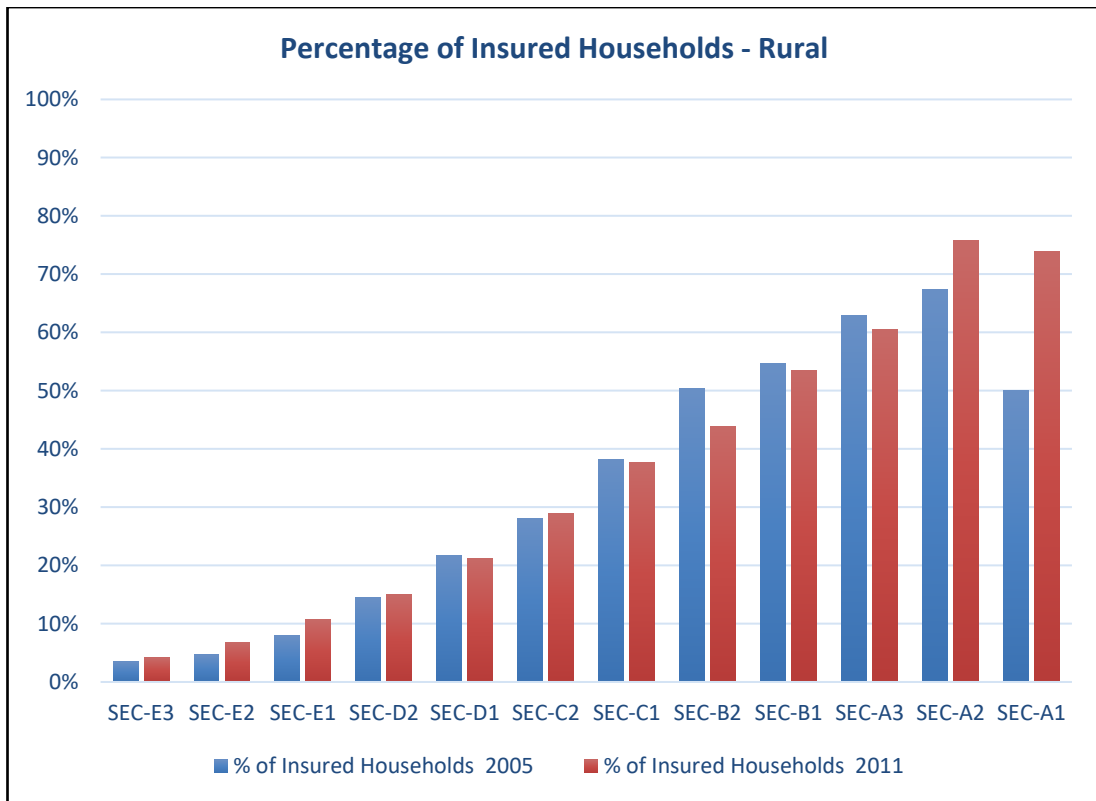
Figure 2.1Percentage of Insured Households in 2005 and 2011 - Rural Households
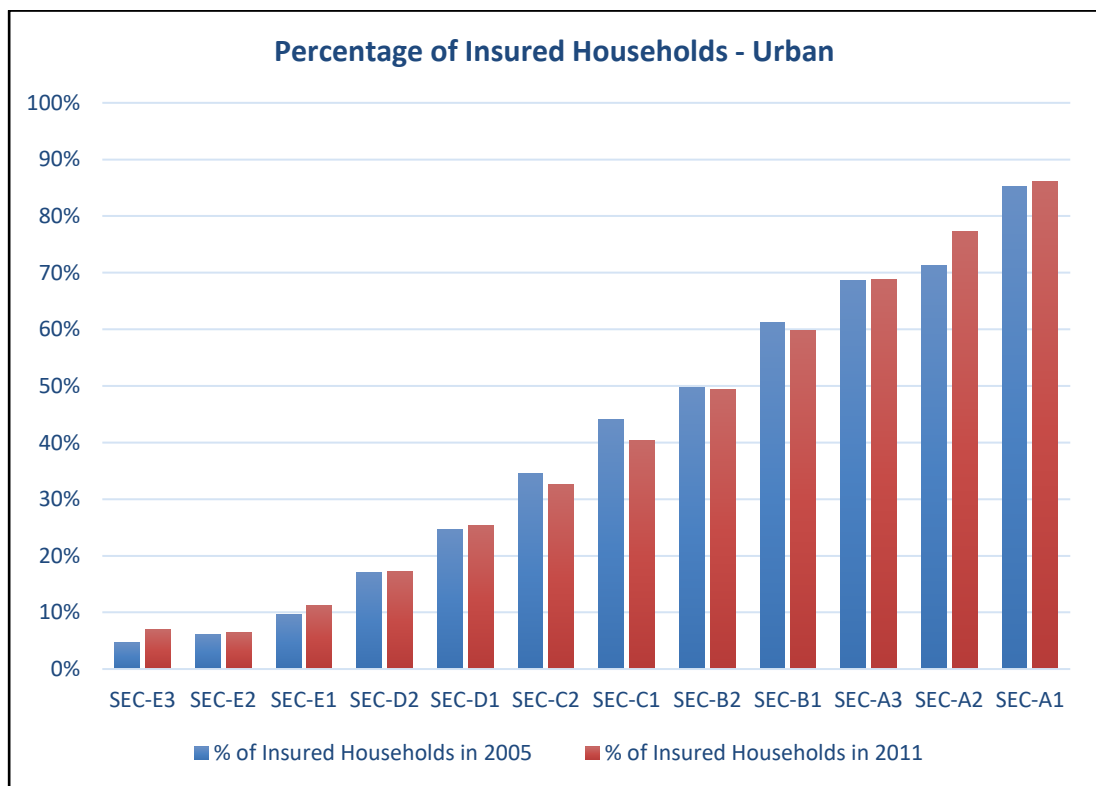
Figure 2.2Percentage of Insured Households in 2005 and 2011 -Urban Households

Amongst rural households, the percentage of insured households increased significantly in the SEC categories A2 and A1. The percentage of insured households also increased somewhat in the poorest households (E3, E2, E1 and D2).

However, in the middle socioeconomic categories, the percentage of insured households has actually decreased. Amongst the urban households, the percentage insured has increased in almost all the SEC categories except C2, C1, B2 and B1. However, the level of increase in percentage insured has been smaller than in rural households. From Figure 2 we see that the penetration of life insurance in the higher SEC categories such as A2 and A3 has been significant.

Socio- demographic Characteristics: A comparison of the socio demographic conditions of insured and uninsured household has been given in Table 2.3 and Figures. B (Appendix C). Table shows that the heads of uninsured households are relatively younger then insured both in rural and urban areas. The difference in average ages of insured and uninsured was higher in the year 2005 but in 2011 both categories are almost equal. Insured households are more educated than uninsured; they have higher income and consumption expenditures than uninsured households in rural as well as urban areas. The differences in the income and consumption expenditures of insured and uninsured households are very large. Also insured households have larger family size and more number of children than uninsured households.

Table 2.3 Comparison of Insured and Uninsured Household Characteristics

Household Characteristics	2005				2011			
	Insured		Uninsured		Insured		Uninsured	
	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban
Avg. Age	49.19	48.96	47.94	46.95	49.57	50.61	49.24	50.01
Avg. Education	6.67	9.44	3.44	5.85	6.28	9.05	3.91	6.05
Avg. Income (in 000 INR)	82.1	114.8	37.0	54.1	150.9	233.1	74.6	112.3
Avg. Consumption Expenditure (in 000 INR)	82.0	92.5	41.9	53.4	142.9	190.9	84.8	111.4
Avg. Family Size	6.65	5.54	5.93	5.42	5.20	4.90	4.79	4.73

2.5.1   Checking data for Multicollinearity:

As can be seen from Table 2.4, the Variance Inflation factor (VIF) of none of the variables was greater than 10 indicating that we need not worry about multicollinearity.

Table 2.4 VIF for Different Independent Variables

Collinearity Statistics					
Variable	Tolerance	VIF	Variable	Tolerance	VIF
LN_INCOME05	0.45	2.25	NEW_CHILD	0.70	1.42
PER_C_INCOME	0.69	1.45	POOR	0.80	1.26
HEADAGE11	0.85	1.18	ACQUIRED_BPL	0.98	1.02
HEADSEX11	0.71	1.41	ACQUIRED_BANK_AC	0.97	1.03
FAMILY_SIZE_CHNG	0.66	1.52	ACQUIRED_BANK_LOAN	0.96	1.04
URBAN11	0.80	1.25	SEC05	0.31	3.23
HEAD_EDUCATION11	0.48	2.10	SEC11	0.27	3.67
NMARRIED	0.99	1.01	SEC_IMP	0.98	1.02
WIDOWED	0.72	1.39			

2.5.2   Acquisition of Life Insurance -Results of the Logistic Regression Models

Preliminary analysis: In the preliminary analysis several logit models were built using step wise backward regression. These models were built to check the significance and relative

importance of each independent variable. These models are not included in the discussion but have been provided in the Appendix D.

In order to check the relative importance of each category of the variable and to compute change in residual deviance, several nested models were built for acquisition and discontinuation of life insurance. These models are given in Appendix D and Appendix E, only the results of changes in residual deviance have been included in the discussion.

Table 2.5 gives a summary of the results of final three models that were built to understand the effect of different socio-economic and demographic factors on the *purchase* of life insurance in rural and urban households. We have different models for urban and rural households, because it was hypothesized that different factors may affect decision making in rural and urban households. For each model β coefficients have been reported along with stars to indicate whether that particular variable was significant at 0.000, 0.001, 0.01 or 0.05 significance level indicated by three stars, two stars, one star and a point respectively.

We find that most of the socio-economic and demographic variables have in fact a statistically significant effect on the probability of buying of life insurance, due to the large size of the sample. We discuss these results below. Some of the variables had similar effects in both rural and urban households while some affected only rural households.

As explained in Section 1.5.3, in order to gain an understanding of the relative importance of different kinds of predictor variables, we performed ANOVA on nested models by removing one block of variables at a time. The results of this ANOVA are given in Table 2.6. We discuss the effect of different independent variables on the probability of a household buying of life insurance below.

SEC Category: In rural households all SEC categories had a statistically significant effect on buying except the highest SEC category (A1). Interestingly the beta coefficient of each higher SEC category was progressively larger as one moved from low socio-economic class to higher economic classes, indicating a monotonically increasing probability of buying life insurance. In

urban households, the beta coefficients for higher SEC categories were larger than those for lower SEC categories indicating a higher probability of acquiring life insurance. However, it did not increase monotonically as it did in rural households.

Improvement of SEC status for a household increased the probability of being insured while decline in SEC status reduced this probability. As we can see from the ANOVA results from Table 2.6, the change in the deviance is highest when we drop variables related to the SEC category of the household.

Poverty Status: Regression results suggest that a household that falls into the "Poor" category (as defined by the poverty line defined by the Rangarajan report) based on its consumption expenditure has a lower probability of buying life insurance. A "poor" household has a large negative correlation with insured status in both rural and urban models. We also included a variable related to a household acquiring a below poverty line (BPL) ration card, this was not statistically significant.

Log of household income and percent change in income: Income related variables, viz. the log of household income and percent change in income had the next highest predictive ability as per the ANOVA results. The reported income of a household is distinct from the SEC class. The SEC class is an indicator of accumulated assets and educational status, while reported income may fluctuate from one-time period to another. High income households have a higher probability of being insured, and the beta coefficient is higher in urban models compared to rural models. This indicates that there are possibly barriers to buying life insurance in rural areas other than income, namely access to information and awareness of life insurance products.

Demographic factors: Change in family size, age and gender of the head of the household, education level of the household head are all statistically significant variables. However, as seen from the ANOVA results, this category of variable has lower predictive value. When the head of the household has more education the probability of buying life insurance is more. An

increase in size of the family increases the probability of buying life insurance. Households headed by women are less likely to buy life insurance.

Table 2.5 Results of Logistic Regression Models for Acquisition of Life Insurance

	RURAL MODEL		URBAN MODEL		COMBINED MODEL	
	Estimated Coefficient		Estimated Coefficient		Estimated Coefficient	
(Intercept)	-5.658	***	-8.320	***	-6.351	***
LN_INCOME05	0.308	***	0.611	***	0.382	***
PER_C_INCOME#	0.065	***	0.121	***	0.079	***
HEADSEX ##	-0.005	**	-0.010	***	-0.006	***
HEADAGE11	0.222	***	-0.017		0.133	*
FAMILY_SIZE_CHNG	0.308	***	0.306	***	0.305	***
HEAD_EDUCATION11	0.033	***	0.024	**	0.030	***
NEW_MARRIED	-0.561	.	-0.167		-0.355	.
NEW_CHILD	0.031		0.059		0.040	
WIDOWED	-0.081		0.002		-0.060	
POOR	-0.771	***	-0.660	***	-0.726	***
ACQUIRED_BPL	-0.057		-0.105		-0.074	.
ACQUIRED_BANK_AC	0.231	***	0.293	***	0.247	***
ACQUIRED_BANK_LOAN	0.338	***	0.389	***	0.359	***
SEC052† (SEC - E2)	0.413	***	0.421	.	0.409	***
SEC053† (SEC - E1)	0.513	***	0.369	.	0.483	***
SEC054† (SEC - D2)	0.748	***	0.605	**	0.714	***
SEC055† (SEC - D1)	0.918	***	0.594	**	0.816	***
SEC056† (SEC - C2)	0.998	***	0.848	***	0.972	***
SEC057† (SEC - C1)	1.104	***	0.792	***	1.008	***
SEC058† (SEC - B2)	1.309	***	1.203	***	1.330	***
SEC059† (SEC - B1)	1.556	***	1.048	***	1.352	***
SEC0510† (SEC - A3)	1.792	***	1.348	***	1.630	***
SEC0511† (SEC - A2)	1.530	***	1.499	***	1.710	***
SEC0512† (SEC - A1)	0.258		1.414	*	1.358	**
IMPROVEMENT IN SEC STATUS‡	0.560	***	0.594	***	0.569	***
DECLINE IN SEC STATUS‡	-0.347	***	-0.244	*	-0.314	***
URBAN Ω					0.266	***
AIC	17387		7812.5		25202	
Number of Households	20354		7245		27599	

#Percent Change in Income, ## Female = 1, Male = 0, Ω Rural = 0, Urban = 1
† Compared to the base category SEC - E3.
‡ Compared to the base category of no change in SEC status

2.5.3 Results of ANOVA of Nested Models

Table 2.6 ANOVA Results of Models for Buying of Life Insurance

	Acquiring Life Insurance		
	Residual Deviance of Full Model: 25146		
Category of Variables Dropped	**Residual Deviance After Dropping Variables**	**Changes in the Residual Deviance**	**p-Value**
SEC	25552	-406	2.20E-16
Poverty Status	25455	-309	2.20E-16
Reported Income and Change in Reported Income	25442	-296	2.20E-16
Demographic	25406	-260	2.20E-16
Bank A/c and Loan	25269	-123	2.20E-16

Relationship with banks: Another group of variables that affect life insurance purchase in a similar manner in both rural and urban households is related to whether the household has acquired a bank account and whether the household has taken bank loans. We find that opening of a bank account and taking a bank loan both have statistically significant and positive correlations with the purchase of life insurance. This indicates that households that initiate a relationship with a bank are more likely to purchase life insurance. ANOVA results suggest that this category of variables has the third lowest effect size on insured status in both rural and urban households.

Urban vs. rural: While it makes sense to model the rural and urban households separately, we also built a combined model in order to compare the probabilities of purchase of life insurance between urban and rural households. The positive and statistically significant coefficient for this variable in the combined model indicates that urban households have a higher probability of purchasing life insurance. This may be due to the higher accessibility of insurance agents and services in urban centers.

2.5.4   Discontinuation of Life Insurance -Results of Logistic Regression Models

We now turn to discontinuation of life insurance coverage by households. Table 2.7 gives a summary of the results of models that were built to understand the factors that affect the probability of an insured household discontinuing life insurance coverage. We find that most of the socio-economic and demographic variables have in fact a statistically significant effect on the probability of discontinuation of life insurance, due to the large size of the sample**.**

The results of ANOVA of nested models are given in Table 2.8. We discuss these results below. Some of the variables had similar effects in both rural and urban households while some affected only rural households.

SEC Category: As we can see from the ANOVA results, the change in the deviance is highest when we drop variables related to the SEC category of the household. Households in higher SEC categories had a lower probability of discontinuing their policies compared to the households in lower SEC categories. However, this effect is much more pronounced in almost all SEC categories among the rural households. Among the urban households, the effect was mostly seen in the highest SEC category. An improvement in SEC status from 2005 to 2011 decreased the probability of discontinuation while a decline in SEC status resulted in an increase in this probability.

Log of household income and percent change in income: Income related variables, viz. the log of household income and percent change in income had the next highest predictive ability. The reported income of a household is distinct from the SEC class, since SEC categorization is based on ownership of assets which indicates the accumulated wealth and financial stability of the household.

Poverty Status: Unlike the models for purchase of life insurance, poverty was less important in the model for discontinuation of life insurance, possibly because poor households would not have life insurance to begin with. However, as in the models for buying of life insurance, being poor was statistically significant and positively correlated with discontinuation of life insurance. Having a BPL card was not statistically significant.

Table 2.7 Results of Logistic Regression Models for Discontinuation of Life Insurance

	RURAL MODEL		URBAN MODEL		COMBINED MODEL	
	Estimated Coefficient		Estimated Coefficient		Estimated Coefficient	
(Intercept)	3.041	***	5.019	***	3.726	***
LN_INCOME05	-0.226	***	-0.415	***	-0.300	***
PER_C_INCOME#	-0.086	***	-0.187	***	-0.122	***
HEADSEX ##	0.009	**	0.011	***	0.010	***
HEADAGE11	-0.192		0.073		-0.072	
FAMILY_SIZE_CHNG	-0.382	***	-0.723	***	-0.525	***
HEAD_EDUCATION11	0.006		-0.028	*	-0.007	
NEW_MARRIED	0.809		0.077		0.431	
NEW_CHILD	0.062		0.123		0.096	
WIDOWED	0.006		0.100		0.079	
POOR	0.714	***	0.771	***	0.730	***
ACQUIRED_BPL	-0.014		0.109		0.031	
ACQUIRED_BANK_AC	-0.107		-0.026		-0.068	
ACQUIRED_BANK_LOAN	-0.574	***	-0.434	***	-0.509	***
SEC052† (SEC - E2)	-0.031		-0.093		0.013	
SEC053† (SEC - E1)	-0.209		-0.541		-0.199	
SEC054† (SEC - D2)	-0.548	*	-0.832		-0.512	*
SEC055† (SEC - D1)	-0.566	*	-0.920		-0.569	*
SEC056† (SEC - C2)	-0.850	**	-1.011		-0.772	**
SEC057† (SEC - C1)	-0.965	***	-1.103	.	-0.889	***
SEC058† (SEC - B2)	-1.193	***	-1.015		-0.962	***
SEC059† (SEC - B1)	-1.472	***	-1.152	.	-1.172	***
SEC0510† (SEC - A3)	-1.553	***	-1.129	.	-1.212	***
SEC0511† (SEC - A2)	-2.592	***	-1.242	.	-1.502	***
SEC0512† (SEC - A1)	-0.827		-1.805	*	-1.830	***
IMPROVEMENT IN SEC STATUS‡	-0.561	***	-0.356	***	-0.477	***
DECLINE IN SEC STATUS‡	0.496	***	0.294	*	0.405	***
URBAN Ω					-0.209	***
AIC	4555.1		4238.1		8792.1	
Number of Households	3633		3653		7286	

Percent Change in Income, ## Female = 1, Male = 0, Ω Rural = 0, Urban = 1

† Compared to the base category SEC - E3.

‡ Compared to the base category of no change in SEC status

Table 2.8 ANOVA Results of Models for Discontinuation of Life Insurance

Category of Variables Dropped	Discontinuing Life Insurance		
	Residual Deviance of Full Model: 8736.1		
	Residual Deviance After Dropping Variables	Changes in the Residual Deviance	p-Value
SEC	8885.6	-149.5	2.20E-16
Reported Income and Change in Reported Income	8842.5	-106.4	2.20E-16
Demographic	8826.5	-90.4	3.22E-15
Poverty Status	8818.0	-81.9	2.20E-16
Bank A/c and Loan	8790.4	-54.3	1.59E-12

Relationship with banks: Acquiring a loan from bank is negatively correlated with life insurance policy discontinuation for rural households. This is the opposite effect of that seen in the previous models related to life insurance purchase. Opening a bank account was not statistically significant either for rural or urban households.

Demographic factors: Family size has a highly statistically significant and negative correlation with discontinuation of life insurance coverage. Interestingly, households with female heads are more likely to discontinue life coverage as compared to households with male heads. The level of education of the head of the household has a statistically significant and *negative* correlation with discontinuation of life insurance coverage only in urban households.

2.5.5   Expenditure on Insurance Premium - Results of Linear Regression Models

The results of the regression models for rural and urban households are given in Table 2.9. We discuss these results below. The overall fit of the models as measured by the adjusted R square was not very high; 0.23 for rural and 0.30 for urban households. However, given the large size of the dataset, these values are not considered to be too low.

Table 2.9 Results of Regression Models for Expenditure on Insurance in 2011

Regression Models for Total Amount of Expenditure on Insurance						
	RURAL MODEL			URBAN MODEL		
	Estimate	Std. Estimate		Estimate	Std. Estimate	
(Intercept)	1.760	0.000	***	-1.551	0.000	*
LN_INCOME11	0.089	0.101	***	0.182	0.144	**
LN_CONSUMPTION11	0.468	0.298	***	0.675	0.368	**
HEADAGE11	0.000	0.004		0.003	0.028	
HEADSEX112	-0.149	-0.050	*	-0.266	-0.075	*
NPERSONS11	-0.043	-0.104	***	-0.069	-0.132	**
NCHILD11	0.057	0.083	***	0.076	0.082	**
HEAD_EDUCATION11	-0.002	-0.009		0.017	0.069	**
MARITAL_STATUS1	-0.355	-0.027	*	0.240	0.019	
MARITAL_STATUS2	0.193	0.061	**	0.305	0.086	**
MARITAL_STATUS3	0.205	0.045	*	0.305	0.049	*
BPL111	-0.127	-0.060	***	-0.183	-0.062	**
POOR1	-0.086	-0.026	.	0.015	0.004	
BANK_LOAN111	0.059	0.027	*	0.068	0.026	
SEC112†- SEC E2	0.042	0.007		-0.017	-0.001	
SEC113†- SEC E1	0.060	0.016		-0.096	-0.009	
SEC114† - SEC D2	0.002	0.001		-0.089	-0.015	
SEC115† - SEC D1	0.075	0.025		-0.125	-0.029	
SEC116† - SEC C2	0.194	0.066		-0.197	-0.053	
SEC117† - SEC C1	0.192	0.071		-0.118	-0.036	
SEC118† - SEC B2	0.320	0.096	*	-0.200	-0.060	
SEC119† - SEC B1	0.274	0.087	.	-0.122	-0.038	
SEC1110† - SEC A3	0.423	0.134	**	-0.103	-0.037	
SEC1111† - SEC A2	0.702	0.137	***	0.118	0.034	
SEC1112†- SEC A1	0.775	0.041	**	0.232	0.028	
N	4737			3971		
R Squared	0.2334			0.3044		
Adjusted R Squared	0.2295			0.3002		

† Compared to the base category SEC - E3.
‡Marital Status: 0 - Married, 1 - Single, 2 - Widowed, 3 - Divorced

Log of Consumption Expenditure and Log of Income: The most important predictor for the total amount of insurance expenditure incurred in both rural and urban households was the consumption expenditure as well as the reported household income. A 1% increase in consumption expenditure led to a 0.47% increase in insurance expenditure in rural and a 0.68% increase in urban households. A 1% increase in reported income led to a 0.09 % increase in insurance expenditure in rural and a 0.18% increase in urban households. Other demographic variables such as age of the head of the household and the marital status do not seem to affect the probability of households dropping life insurance cover.

SEC Categories: The SEC category that the household belongs to was statistically significant in the rural households but not in the urban households. In the rural households, belonging to the highest socio-economic groups, A1, A2, A3, B1 and B2, increased the expenditure on insurance (compared to the base SEC category i.e. E3) in an almost monotonically increasing manner.

Demographic variables: Marital status of the head of the household also had a statistically significant effect but only in urban households. Interestingly, heads of households that were widowed or divorced spent more on insurance compared to those that were married. If the head of the household was single, it reduced insurance expenditure among rural households.

Households headed by women spent less on insurance - about 0.15% less (in rural areas) and 0.27% lower (in urban areas), compared to households headed by men.

Household size and number of children in the household both affected the insurance expenditure but had opposite effects. Each additional child led to an increase in insurance expenditure of 0.06% in rural and 0.08% in urban households. This possibly indicates a bequest motive in the insurance demand. An additional member in the household reduced the insurance expenditure by 0.04% possibly due to the increase in other expenditures and hence a lack of affordability of insurance in larger households.

Having a BPL card reduced the expenditure on insurance in both rural and urban households. Households who took bank loans paid a little more in insurance in rural households. This effect was not statistically significant in urban households.

2.6   Discussion

Prior studies have looked at how demographic and socioeconomic variables affect life insurance demand in a household at a given point of time. With the exception of some studies such as Liebenberg *et al.* (2012) and Heo *et al.* (2013) most studies do not look at changes in insured status.

In this study, we shed new light on the factors that affect changes in insured status using short panel data from a large survey of households across India in 2004-05 and 2011-12. The results of the study are robust as they provide consistent β estimates, both in terms of direction and magnitude for both rural and urban household models. The effects are similar but in reverse direction for the models of discontinuation of life insurance.

The single largest determinant of whether an uninsured household will purchase life insurance or an insured household will discontinue life insurance coverage is the financial condition of the household. This is measured by several independent variables such as the socioeconomic category that the household belongs to, reported income and percentage change in household income as well as the reported consumption expenditure. We see both positive and negative effects, consistent with improvement or worsening of financial conditions, on life insurance purchase and discontinuation, in both urban and rural households. We consider this finding to be consistent with several other studies from developed as well as developing countries.

An increase in family size had a positive effect on the probability of purchase and negative effect on the probability of discontinuation of life insurance. However, the amount of insurance expenditure was negatively correlated with the household size, possibly indicating that the affordability of insurance in larger households is smaller. Households headed by women are

less likely to purchase life insurance than households headed by men. Additionally, the expenditure on insurance was also smaller when the household head was a woman. Education affected life insurance purchase positively in both rural and urban households. The age of the household head affected purchase of life insurance in rural households but not in urban ones.

We conclude by observing that the Indian population represents a large and incompletely-tapped market for life insurance products. The majority of households surveyed did not have life insurance. The strongest determinant of whether a household acquires or discontinues a life insurance policy is its financial condition, followed by education level. These findings indicate that there is great room for existing life insurance companies to expand their operations, and also tremendous scope for social and governmental agencies to provide more simple and meaningful and widespread education to the public about the role of life insurance in their lives.

Limitations and future research: While this study has covered a very large dataset across Indian households, it was limited by the variables which were already included in the Indian Household Development Survey, the primary aim of which was not targeted towards the life insurance sector. There have been several policy changes with the life insurance sector being opened up to private players in late 1990's. The Insurance Regulatory and Development Authority of India (IRDAI) try to increase the awareness of insurance. Lower premiums and greater awareness led by both IRDAI and advertisements may lead to more people purchasing life insurance products. In this study, we could not see the effect of these specific changes in the life insurance sector in India. These could possibly be studied in future research.

Chapter 3. Consumer Behavior in Life Insurance: Theory of Planned Behavior

3.1   Introduction

Much of the research on insurance markets in India has been descriptive (Ranade and Ahuja, 1999; Rao, 1999; Sinha, 2007). Empirical studies have primarily looked at socio-economic and demographic factors that affect the purchase of insurance. These studies (Townsend, 1994; Sen, 2008; Kakkar and Shukla, 2010) provide an understanding of how factors such as income, age, education and life stage events affect demand. However, these studies do not provide an understanding of the actual decision-making process from a consumer behavior point of view.

There have been some behavioral studies in insurance in the context of western countries (Fletcher & Hastings, 1983, 1984; Kurland, 1995; Gotllieb, 2012); in Malaysia (Haron *et. al.*, 2011; Rahim and Amin, 2011; Husin and Rahman, 2013) and in Nigeria (Omar, 2007; Omar and Frimpong, 2007). However, the findings from these studies cannot be generalized to a country such as India due to differences in social, cultural, educational, political and regulatory environment, as well as the differences in the development of financial markets.

The level of financial literacy and financial capabilities in emerging countries such as India is low compared to more developed countries. In the absence of adequate financial understanding and knowledge, and given the fact that these are important decisions, many prospective consumers may look for external guidance. So, they may be influenced by their family members and friends who have already purchased life insurance or by insurance agents. Cultural differences can also lead to significant differences in the way individuals view insurance (Chui and Kwok, 2008). The Indian culture is more collectivistic, less egalitarian (high power distance) and has high levels of long term orientation and low levels of indulgence compared to western cultures (Farver *et al.*, 2002; Dion and Dion, 1993; Sinha and Tripathi, 2004). Because of the collectivistic culture, individuals may be more inclined to looking for

advice from others. High power distance may lead to greater trust in the word of "experts" and acceptance of social norms. Long term orientation and low indulgence indicates that savings rates would be high and individuals may look for appropriate ways to invest their savings.

The role of the insurance agent is critical in conveying information about insurance and selling of insurance. In particular, the Life Insurance Corporation of India (LIC) has been selling insurance through a large network of LIC agents for several decades. These agents often have other jobs and sell insurance informally through their personal social networks (Ranade and Ahuja, 1999). Given the reputation of LIC[16], the personal connections with agents, and the inability to understand the complexities of the insurance products, consumers often place a significant amount of trust in their agents. Thus, agents have a lot of influence in the decision-making process. They guide clients not only in the choice of insurance policy but also the amount of insurance they should purchase. However, agents are motivated by commissions they earn for the policies that they sell. This leads to a situation with a moral hazard, where the advisor may have a conflict of interest with the advisee. This can and does lead to mis-selling (Halan *et al.* 2014, Anagol *et al.*, 2017) resulting in significant losses borne by the consumer.

Given this background, it is important to understand how individuals form their intention to purchase life insurance. This forms the motivation for this study.

Behavioral intention models have often been used in the consumer behavior literature to understand how consumers decide to purchase different consumer goods and services. The theory of reasoned action (Fishbein and Ajzen, 1975) and theory of planned behavior (Ajzen, 1985) are two behavioral intention models that have been widely used by researchers. In this study, we attempt to build a model of insurance purchase decisions based on the theory of planned behavior (Fishbein and Ajzen, 1985). A survey was conducted, and data was collected from four different states in India. Our final sample consisted of 386 respondents. A structural

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[16]In India the word "LIC policy" is often used interchangeably with insurance policy. This is similar to the use of the word Xerox for photocopying. This indicates the extent to which LIC is synonymous with insurance in India.

equation model was used to test several hypotheses about the way beliefs, attitudes, social norms and perceived behavioral control affect the purchase of life insurance.

We find that belief and subjective norms are highly correlated constructs and should be ideally treated as one factor. This is possibly because of the fact that in India, there is no independent education about insurance and all knowledge is based on word of mouth or recommendations of life insurance agents and social groups. Using this new construct in our model we find that beliefs and subjective norms have a positive influence on life insurance purchase through attitude toward life insurance. It has the highest indirect effect on insurance purchase. Attitude toward life insurance has positive effect on life insurance purchase. Perceived behavioral control influences life insurance purchase negatively but to a much smaller extent. Overall our model was found to have a good fit.

3.2   Theoretical background

3.2.1   Theory of Reasoned Action (TRA)

The theory of reasoned action (Fishbein and Ajzen, 1975) is a psychological theory that models human behavior under volitional control (individual can determine at will to perform or not to perform a behavior). According to the theory, a person's intention to perform or not to perform a behavior is the immediate determinant of his actual behavior. Further this theory postulates that conscious human intentions can be predicted using several behavioral constructs namely attitude, belief and subjective norms. Fishbein and Ajzen's (1975) expectancy-value model of attitudes indicates that attitudes towards any action are a function of the beliefs held about the outcome of the action and the expectation of each outcome occurring. Thus, if a student believes that studying for an exam will get him better grades (outcome) and knows that there is a high probability of this positive outcome (expectation), then the two will combine to improve his attitude towards studying for the exam.

Belief, attitude and subjective norms are the three components of the theory where belief is defined as the evaluation of the consequences of performing (or not performing) a specific behavior or action. Attitude towards a behavior refers to the extent to which a behavior is evaluated either positively or negatively. Subjective norms are perception of the social pressure imposed on an individual for performing or not performing a behavior.

Behavioral intention (a proxy for the actual behavior) is a function of attitude towards a behavior and subjective norms. Fishbein and Ajzen (2008) also proposed via the expectancy value model that attitudes are affected by belief towards the consequences of behavior using. These constructs can be used to predict the intention or overall behavior toward the act.

Mathematically it can be expressed as:

$$\boldsymbol{B_{act}} \sim \boldsymbol{BI} \propto (\boldsymbol{W_1} * \boldsymbol{Att} + \boldsymbol{W_2} * \boldsymbol{SN}), \qquad \text{Equation (3.1)}$$

$$\boldsymbol{Att} \propto \sum_{i=1}^{n} \boldsymbol{b_i e_i}, \qquad \text{Equation (3.2)}$$

$$\boldsymbol{SN} \propto (\boldsymbol{W_b} * \boldsymbol{sb_i}) \qquad \text{Equation (3.3)}$$

where   Bact   - Actual behavior

             BI   - Behavioral Intention,

             Att   - Attitude toward the behavior,

             SN   - Subjective Norms and

             Sb_i - social beliefs toward the consequences of behavior

             b_i - personal beliefs

             W_1, W_2, W_a, W_b are the empirically estimated weights for different constructs.

Theory of reasoned action predicts behavior well; however, there are a couple of caveats. First, intentions should be an accurate measure of actual behavior. This is possible if time between stating intentions and actual behavior is small and the behavior is under volitional control.

3.2.2   Theory of Planned Behavior (TPB)

The theory of reasoned action assumes the behavior to be under volitional control (i.e. person can take the decision at will to perform or not to perform a behavior) and that behavioral intention is closely related to the actual behavior. Theory of planned behavior postulates that attitudes, beliefs and subjective norms will translate to behavior - but only if (i) the person feels that he can control his actions (or he has control over his behavior) and (ii) the duration of expressing the behavior intention and actually performing the behavior is small.

If beliefs, attitudes and subjective norms translate into behavioral intention, but behavioral intention does not translate into actual behavior than there might be some external factors that are hampering the behavior. These factors could be beyond the person's control. These factors must be identified and incorporated in the model to improve the predictability. Hence, the theory of planned behavior (Ajzen, 1991) introduces a new component in the theory of reasoned action namely behavioral expectation (BE) which refers to a person's estimation of the expectation that he actually will perform a certain behavior. An individual will have a higher behavioral expectation if he is intended to perform a behavior (BI) and has control over his behavior (PBC).

$$BE \propto (PBC * BI)$$ \hfill Equation (3.4)
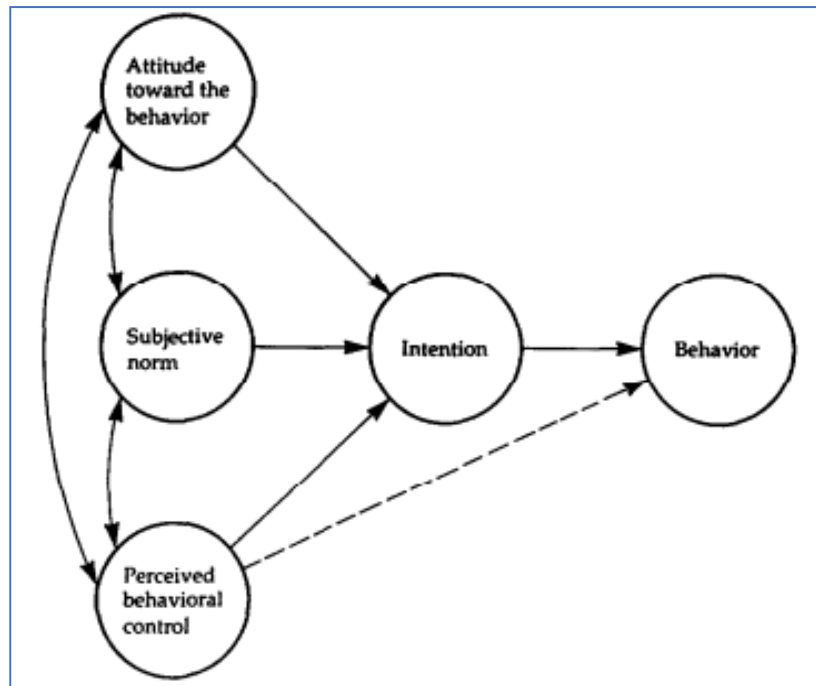
Figure 3.1 Pictorial Depiction of the Theory of Planned Behavior (Source: Ajzen, 1985)

3.3   Literature Review

Life insurance is a tool used for mitigating financial risk arising due to the untimely death of the main bread earner of the family. It mitigates the financial risk for an individual or household by pooling and redistributing of risk among a large group of people. The motives for purchase of life insurance have been researched in the framework of classical as well as behavioral economics. These have been discussed briefly below.

3.3.1   Rational and Behavioral Theories in Insurance Economics

In classical economics theory, the decision to purchase insurance is treated as a rational choice made by consumers who try to maximize their lifetime utility under wealth and information constraints. Motives for taking insurance may include risk minimization, investment motives and bequest motives. Lifetime utility is expressed as a function of desired bequest amounts, wish to delay consumption to a later time (such as retirement) and returns on savings (where insurance acts as an investment vehicle). These utility functions (which may also have some

stochastic component depending on the expected probabilities associated with untimely demise) are optimized to maximize the total lifetime utility [see Yaari (1965), Fischer (1973), Karni and Zilcha (1986), Bernheim (1991)]. It is presumed that consumers are rational and capable of understanding and processing all relevant information regarding their choices.

Several studies observed a departure from rational behavior when individuals make choices under risk and uncertainty. Slovic *et al.* (1977) found that people buy more insurance for a high probability low-loss event than a low probability high-loss event, and do not buy insurance for an event which has a probability below a certain threshold. Auerbach and Kotlikoff (1989) found that a significant proportion of American housewives had insufficient life insurance coverage. Wekkar *et al.* (1997) and Zimmer *et al.* (2009) found that people do not favor default risk in an insurance policy and demand a high reduction in the insurance premium to compensate for the default risk. Kunreuther and Pauly (2004) found that people do not buy insurance for low probability high loss events even when insurance premiums are actuarially fair. All these findings are contrary to standard insurance models.

These anomalies in insurance purchase behaviors and their deviation from the standard insurance models have been explained through several behavioral economics theories. Model of bounded rationality (Simon 1957) suggest that the ability to make rational decisions is limited by (i) the tractability of the problem, (ii) the cognitive ability of human mind and (iii) the availability of time to make the decision. Under these restrictions people make a satisficing choice rather than a rational choice. Prospect theory (Kahneman and Tversky 1979) suggests that people are loss-averse and often underestimate large probability and overestimate small probability. Regret theory (Loomes and Sugden 1982) proposes that when making choices under uncertainty people often experience an emotional response of regret if the desired outcome is not achieved. Thus, individuals incorporate this negative emotional component in their choices to reduce the anticipated regret. Wilde (1982) proposed the risk homeostasis hypothesis that suggests that people are comfortable with a certain level of risk and adjust their

behavior according to the risky situation. He further argued that individuals maximize their total benefits by comparing the costs and benefits of their risky and safe choices.

Behavioral studies also suggest that several behavioral factors such as emotions, affection, culture and societal norms have a significant influence on insurance decisions. Zelizer (1978) found that in the early19[th] century, life insurance was rejected in the American society because of the social view that life insurance is converting a sacred event of death into a commodity. Burnett and Palmer (1984) found that fatalism, socialization preferences and religion salience were among the most important determinants of life insurance purchase. Hsee and Kunreuther (2000) argued that if an individual has a strong affection for an object, they would be willing to buy more insurance for that object in comparison with any other object. Buzatau (2013) argued that emotions, personal biases, social norms and financial culture have a strong influence on insurance purchase decisions.

3.3.2   Behavioral Models of Insurance Purchase

In the following section we discuss some notable studies which looked at life insurance purchase from behavioral view point. These include studies where theory of reasoned action and theory of planned behavior were applied to predict life insurance purchase behaviors.

3.3.3   Insurance Purchase - Behavioral and Psychographic Factors

Ferber and Lee (1980) studied life insurance purchase among young married couples. They found that the financial status is the primary determinant of life insurance purchase. They also found that certain behavioral and attitudinal factors such as spending and saving practices and attitude towards saving influence the life insurance purchase behavior. Burnett and Palmer (1983) in a study with consumer panel data of American south western city found that, insurance agent significantly influence the purchase of insurance. They found that people who have a relationship with insurance agents buy large amount of insurance and consider insurance to be very important. Zhang (2007) in China found that the extent of financial worry, economic

condition, health status and knowledge of life insurance have the significant influence on intention to purchase life insurance. Li *et al*. (1996) found that a significant proportion of the respondents purchase life insurance as a favor toward the insurance sales agents in Taiwan.

Gotllieb (2012) analyzed insufficient insurance among working class, excessive insurance among older people and simultaneous holding of life insurance and annuity. Using a prospect theory-based model he concluded that insurance buying behavior departed significantly from the standard economic model. He also argued that people may not purchase life coverage even when insurance premiums are actuarially fair.

3.3.4   Insurance Purchase - TRA and TPB

There have been a few studies that have looked at the insurance purchase decision through the lens of the theory of reasoned action and the theory of planned behavior. In one of the earliest such study, Fletcher & Hastings (1983, 1984) discussed the validity and relevance of Theory of Reasoned Action in purchase of life insurance purchase behavior. They found that attitude had a significantly larger effect on insurance purchase intention than subjective norms. They also discuss several issues about the applicability of TORA/TOPB models to insurance purchase. these include (i) most consumers do not know much about insurance, (ii) it is not a hedonic product and hence does not generate much interest ("necessary evil"), (iii) the decision to buy insurance is not given much time or consideration, (iv) it is done quickly when the need arises or when the insurance agent makes contact and (v) forgotten thereafter.

Omar (2007) used the theory of reasoned action (TRA) to study life insurance purchase behavior in Nigeria. They found that life insurance purchase intention is influenced by beliefs rather than the attitude. They also argued that lack of confidence in the insurance companies have a negative effect on life insurance purchase. Risk ignorance and family's financial support affect the purchase intention negatively. Omar and Frimpong (2007) found that normative factors influence the intention to take life insurance policies in Nigeria. They argue that

increase in the consumer consciousness and inadequate welfare schemes were encouraging the growth of life insurance market in Nigeria.

Rahim and Amin (2011) studied the factors influencing the acceptance of Islamic insurance (Takaful) among Malaysian bank customers under the framework of the theory of reasoned action. They found that attitude, subjective norm, and amount of information are influential predictors of Islamic insurance. Husin and Rahman (2013) examined the intention toward participation in family Takaful scheme under the framework of the theory of planned behavior. They also found the moderating effects of several consumer specific factors such as demographic variables, consumer knowledge, situational factors and consumer level of religiosity.

Kurland (1995) did a comparative study to analyze the explanatory power of the theory of reasoned action and the theory of planned behavior among U.S. based financial service agents. They also proposed a modified version of the theory of planned behavior by introducing a measure of moral obligation and concluded that inclusion of this factor improves the model's predictability of insurance agents' ethical intentions. Haron, Ismail and Razak (2011) studied unethical behavior of insurance agents in Malaysia; they found that attitude and subjective norms mediate the relationship between supervisor's influence and sales target on agent's intention to perform unethical behavior.

3.4   Research Questions

Studies on life insurance in India have primarily focused on the demographic and socio-economic characteristics of life insurance buyers. The underlying beliefs, attitudes and social norms that guide this behavior have not been explored so far. Our study aims at understanding the decision-making process of life insurance purchase and developing a model that will predict life insurance purchase behavior among Indian population. We look at the purchase of life insurance from a consumer behavior perspective. We are address the following questions in this study:

1. How do people take decision regarding life insurance purchase in India?

2. How do the individual psychographic traits namely, attitudes, beliefs, social norms and perceived behavioral control guide life insurance purchase decisions in India?

3.5 Methodology

3.5.1 Hypotheses

The objective of this study is to understand how individuals form an intention to purchase life insurance in India. Purchase intention (or actual behavior) is a function of individual's attitude (extent to which life insurance purchase is evaluated either positively or negatively) toward life insurance, perception of the social norms on purchase decision and individual's control over the purchase decisions. We also hypothesize that individual attitude, subjective norms and perceived behavioral control is influenced by individual's belief (evaluation of consequences of buying or not buying life insurance) towards life insurance policy. Based on the prior literature on Theory of Planned Behavior (Ajzen, 1985) and its application in insurance decisions (Fletcher and Hestings, 1983, 1984; Omar and Frimpong, 2007 and Kurland, 2009) we formulate the following hypotheses:

H1: Beliefs towards life insurance significantly influence attitude towards life insurance.

H2: Beliefs towards life insurance significantly influence subjective norms about life insurance purchase.

H3: Beliefs towards life insurance significantly influence individual's perceived behavioral control over the life insurance purchase.

H4: Individual's attitude towards life insurance has a significant impact on life insurance purchase intention.

H5: Subjective norms significantly affect life insurance purchase intentions.

H6: Perceived behavioral control has a significant impact on life insurance purchase intention.

3.5.2   Data and Sample

Primary data was collected through a structured questionnaire survey that was administered both online and in person. Respondents were selected using convenient sampling technique. The data in the final sample consists of information for 386 respondents including 136 online respondents and 250 offline respondents. Since we had 12 items that were used to measure three latent constructs, our sample size: item ratio was greater than 20:1. This meets the adequacy requirements as recommended by Tanaka (1987). The questionnaire used has been given in Appendix G.

The target population included existing and prospective life insurance customers. The geographic distribution of respondents was quite diverse with respondents surveyed from several cities and villages from the states of Rajasthan, Uttar Pradesh and Uttarakhand. A map of the cities and villages from which responses were gathered has been given in Appendix H.

3.5.3   Research Instrument

In initial focus group discussions with several insurance customers, we found anecdotal evidence for the fact that many individuals do not understand the complexities of the insurance product and depend on the advice of agents for all decisions related to insurance purchase. Collating the findings from focus groups, a questionnaire was developed. The questionnaire was reviewed by experts in qualitative research and questionnaire designing. Pretesting was done to eliminate any discrepancy and readability issues in the questionnaire. In addition to information on respondent's demographics details, the questionnaire had several questions designed to measure model constructs namely, attitude, behavior, subjective norms and perceived behavioral control (PBC). In addition, respondents were asked to provide their responses about the types of insurance policies purchased, name of the insurer, opinion towards life insurance products and insurance providers, whether any of their life insurance policies had lapsed or matured, reasons for purchasing life insurance policy and level of satisfaction with insurance purchase decision.

3.5.4   Measurement

The items used to measure model constructs and level of satisfaction with insurance purchase decision were measured on agreement scale (five-point Likert scale where 1 indicates "Strongly disagree" and 5 indicate "Strongly agree"). Reasons for purchasing life insurance were measured on importance scale (where 1indicates "Not Important" and 5 indicating "Very Important").

Respondents were asked direct questions to measure their intention towards life insurance purchase. If the respondent did not own a life insurance policy and also did not intend to purchase, it was measured as 0. If respondent did not own a life insurance policy but intended to purchase life cover in near future, it was measured as 1. If respondent has already purchased a life insurance policy, it was considered a positive intent and was measured as 1.

3.6   Results

3.6.1   Exploratory Factor Analysis for Beliefs, Attitudes and Subjective Norms

We performed an exploratory factor analysis to make sure that the item to measure our model construct (Attitude, Belief, Subjective Norms and Perceived Behavioral Control) are loading correctly on different factors.

Table 3.1 shows the results of factors analysis; questions I1, I2, I4, I8, I9 and I11 are loading on factor 1; questions I5, I6 and I13 are loading on factor 2 and questions I7, I10 and I12 are loading on factor 3. Items loading on factor 2 and factor 3 were designed to measure attitude toward life insurance and perceived behavioral control respectively, which are loading correctly on two different factors. Questions I1, I2 and I8 were designed to measure subjective norms; questions I4, I9 and I11 were designed to measure belief toward life insurance. Our factor analysis was not able to differentiate between these two constructs; all 6 items are loading on factor 1. Going with the results of our exploratory factor analysis we combined the two constructs into one factor and named it "Beliefs and subjective norms". In our model we use

this new construct (belief and subjective norms) instead of two separate constructs namely belief toward life insurance and subjective norms.

Reliability: We use Cronbach's alpha to check for the internal consistency of our model constructs. From Table 3.2, we see that the values for Cronbach's alpha are above 0.5 for all 3 constructs which indicates that our model constructs have acceptable levels of reliability.

Table 3.1 Exploratory Factor Analysis of Behavioral Component of Insurance Survey

Construct	Questions	Item No.	Component 1	2	3
Belief	Life insurance provides support in an emergency, such as illness or death	I9	0.735	0.07	-0.16
Belief	I think that in general LIC agents are trustworthy.	I11	0.646	-0.104	0.148
Belief	I think it is very important to have a Life Insurance policy for the security of one's family.	I4	0.608	0.383	-0.047
Subjective Norm	My family members think taking a life insurance policy is necessary.	I8	0.598	0.318	0.079
Subjective Norm	Several of my friends and relatives think that one should buy life insurance policies.	I2	0.55	0.274	0.04
Subjective Norm	Life insurance agents have often explained to me the advantages of buying life insurance.	I1	0.495	0.345	-0.081
Attitude	Life insurance is good for saving for retirement and children's education.	I5	0.197	0.795	0.05
Attitude	Life insurance is a good tax-saving scheme	I6	0.077	0.776	0.013
Attitude	I feel life insurance is a good investment option compared to other options such as Fixed Deposits.	I13	0.322	0.58	0.121
PBC**	It is difficult for me to remember to make regular premium payments.	I7	0.153	-0.086	0.732
PBC	I feel that I will not be able to choose the correct life insurance policy for my needs.	I10	-0.098	0.26	0.675
PBC	I feel that I cannot afford to pay life insurance premiums.	I12	-0.048	0.002	0.761

PBC- Perceived Behavioral Control**

Table 3.2 Reliability statistics to measure the internal consistency of model constructs

Reliability Statistics	
Constructs	Cronbach's Alpha
Attitude	0.681
Belief and Subjective Norms	0.719
Perceived Behavioral Control (PBC)	0.565

3.6.2   Structural Equation Modeling of the Behavioral Intention Model

We use Structural Equation Modeling (SEM) for testing our structural model and hypothesized relationships among model constructs. We use IBM AMOS 21 for the analysis. Structural equation modeling (SEM) is a multivariate modeling technique that allows estimation of a series of multiple regression equations estimated simultaneously (Hair *et al.* 2013). It consists of two basic components: (i) the structural (path) model and (ii) the measurement model. The measurement model allows the researcher to measure a latent construct using several indicator variables. The path model specifies a set of regression equations which indicate the direction of causality where the latent constructs are the independent variables that may lead to a certain dependent variable.

We use the Theory of Planned Behavior to depict the direction of causality in the structural model set up. Several different models were specified to understand the covariance structure in the data. The SEM model was estimated using maximum likelihood estimation (MLE). After several trials, we arrived at the following model that fit the data best.
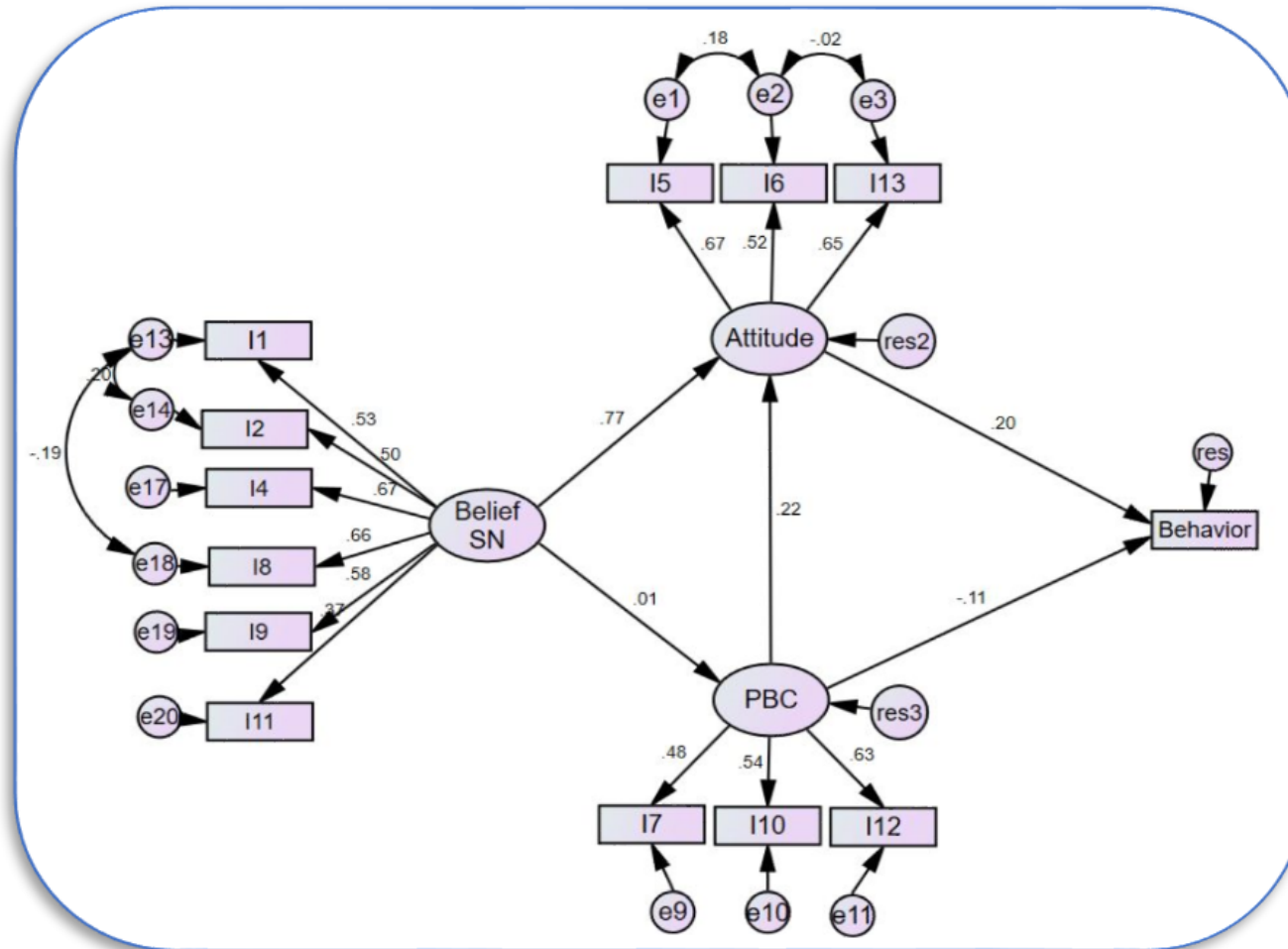
Figure 3.2 Structural Equation Model for Life Insurance Purchase Behavior

The regression Estimates of our Structural Equation Model (SEM) are given in Table 3.3. As we can see from this table, belief and subjective norms have a high positive effect on attitude towards life insurance. Perceived behavioral control affects attitude towards life insurance positively. Belief and subjective norms have positive effect on perceived behavioral control and perceived behavioral control has a negative effect on life insurance purchase behavior. But we find that these two relationships are not statistically significant. Attitude toward life insurance has a highly significant positive effect on life insurance purchase behavior.

Table 3.4 shows the direct and indirect effects of model constructs on life insurance purchase behavior. We find that belief and subjective norms have a positive indirect effect on life insurance purchase behavior. Perceived behavioral control has a positive indirect effect on life insurance behavior. The overall effect of perceived behavioral control on life insurance purchase behavior is negative. Attitude toward life insurance acts as a mediator between belief and subjective norms and behavior; and between perceived behavioral control and behavior.

Table 3.3 Regression Estimates for Life Insurance Purchase

Constructs	Direction	Constructs	Estimates	Std. Estimate	p value
PBC**	←	Belief and Subjective Norms	0.012	0.011	0.882
Attitude	←	Belief and Subjective Norms	0.906	0.767	0.000
Attitude	←	PBC	0.248	0.217	0.007
Behavior	←	Attitude	0.081	0.195	0.003
Behavior	←	PBC	-0.05	-0.105	0.134

PBC- Perceived Behavioral Control**

Table 3.4 Direct, Indirect and Total Effects

Constructs	Belief and Subjective Norms			Perceived Behavioral Control			Attitude		
	Direct Effect	Indirect Effect	Total Effect	Direct Effect	Indirect Effect	Total Effect	Direct Effect	Indirect Effect	Total Effect
	←	←	←	←	←	←	←	←	←
PBC	0.011	0	0.011				0	0	0
Attitude	0.767	0.002	0.769	0.217		0.217			
Behavior	0	0.149	0.149	-0.105	0.042	-0.063	0.195	0	0.195

Proposed Hypotheses – Acceptance or rejection

The hypotheses proposed in Section 3.5.1 are reiterated below with the results from our model to support or reject the hypotheses.

H1: *Beliefs towards life insurance significantly influence attitude towards life insurance*. We find support for this hypothesis and conclude that beliefs do affect attitudes.

H2: *Beliefs towards life insurance significantly influence subjective norms about life insurance purchase*. Beliefs and Subjective norms are in fact identified as one factor. Hence, they are highly correlated to each other.

H3: *Beliefs towards life insurance significantly influence individual's perceived behavioral control over the life insurance purchase*. We fail reject null hypothesis since the effect of beliefs on PBS is statistically not significant.

H4: *Individual's attitude towards life insurance has a significant impact on life insurance purchase intention*. We find that attitude does have a statistically significant effect on behavior.

H5: *Subjective norms significantly affect life insurance purchase intentions*. Subjective norms do affect behavior; however, this effect is indirect, through attitude.

H6: *Perceived behavioral control has a significant impact on life insurance purchase intention*. We fail to reject the null hypothesis since the effect is statistically not significant.

3.6.3   Goodness of fit of the SEM model

Several fit indices are used to measure the goodness of fit of the SEM model. There is some debate about having single threshold values that determine the goodness of fit of a certain model (see Barret, 2007). Hu and Bentler (1999) recommend some a cutoff value of 0.95 for TLI, IFI, RNI and CFI and a value close to 0.06 for RMSEA and SRMR <0.06. Since our sample size is greater than 250, we expect fewer Type II errors. The goodness of fit values for the estimated model are listed in Table3.5. As we can see the RMSEA value for the model is really low with acceptable values for other fit indices (greater than 0.9). Thus, we conclude that our model has acceptable fit.

Table 3.5 Model Fit Summary

		Results from SEM Model	Recommended Threshold Values
NFI	Normed Fit Index (NFI)	0.855	>0.9
RFI		0.801	
IFI	Incremental Fit Index	0.909	
TLI	Tucker Lewis Index	0.872	>0.8
CFI	Comparative fit Index	0.907	>0.9
SRMR		0.052	<0.05 - 0.08
GFI	Goodness of Fit Index	0.95	>0.9
AGFI	Adjusted Goodness of Fit Index	0.92	>0.9
PGFI		0.595	
RMSEA	Root mean square of error approximation	0.061	0.05-0.1

3.7   Discussion

The main objective of this study was to build a model to understand how consumers formed the intention to purchase life insurance. We used the Theory of Planned Behavior as the underlying theoretical model to test how beliefs about insurance, subjective norms, attitudes and perceived behavioral control affected the behavioral intention and finally the behavior of purchasing insurance. We collected primary data from 386 respondents using a questionnaire which had several questions which tried to measure these latent constructs. Exploratory factor analysis indicated that the questions for beliefs and subjective norms loaded on the same factor. That is in the Indian context, beliefs about insurance were completely correlated with subjective norms. A structural equation model was built that indicated that beliefs and subjective norms together had a large effect on attitudes, while perceived behavioral control had a smaller effect on attitude. Attitude had some effect on behavioral intention - but the effect size was not large. Our results show that belief and subjective norms have statistically significant and positive effects on attitude and perceived behavioral control. This indicate that social influences and perception of important referents are very important in life insurance purchase decisions among Indians. Social influences and opinions of the important referents affect the individual attitude towards life insurance products as well as perceived behavioral control which in turn affect the overall decision to buy or not to buy life insurance policies. Our findings suggest that Life insurance decisions in India are more of collectivistic decisions rather than individual decisions. Greater awareness regarding the use, benefits and kind of life insurance policies might affect the level of social influence. This would help in increasing Life insurance penetration among Indian consumers especially, among marginalized and poor ones.

Limitation of the Study: We have used theory of planed behavior to understand life insurance decision making in India which takes into account intention as a proxy for actual behavior. In actual situation individual behavior may differ from intended behavior due to financial and other constrains. This is a limitation of the study which can be addressed in future research.

Chapter 4. Factors Affecting Choice of Insurance Policy

4.1   Introduction

In India, insurance is often perceived as a way to invest one's savings rather than as a way of managing income risk. Cash value policies (or endowment policies) are sold by agents more often than term policies (Bodla and Verma, 2007; Das *et al.*, 2009). Multiple policies are sold to the same person to cover different kinds of investment needs such as saving for one's child's education, marriage expenses or one's own retirement plans. These policies often entail large front-loaded premiums. Insurance sales agents are incentivized to sell such policies with generous commissions for such sales. Consumers that have low levels of financial literacy face sales pressure from insurance agents whom they may know socially and who exert some amount of social influence. This results in consumers buying insurance that they do not need and that are not good investment options in terms of the returns generated.

Several recent studies have reported the fact that there is mis-selling of insurance in emerging markets (Halan *et al.* 2014; Tseng *et al.*2016 and Anagol *et al.* 2017). The reasons for such mis-selling could be three-fold: (i) low levels of financial literacy amongst consumers, (ii) agent commissions that incentivize the selling of whole life policies that typically have higher premiums, and (iii) lack of a proper regulatory environment.

In this chapter, we investigate one aspect the insurance purchase decision, viz. the kind of insurance policies purchased. Using primary data for 298 individuals who own life insurance, we investigate the primary motivations for purchasing insurance. These motives include tax saving motives, risk management motives as well as savings motives. Social motives were also included which indicated the influence of the insurance sales person on the purchase decision. We include several demographic variables in the model as control variables.

We find that purchase of term policies is positively related to tax savings motive and negatively related to investment motives. Endowment policies are not as well as bequest motive. Purchase of multiple policies is positively related to social pressure as well as a wish to save for specific reasons such as children's education and one's own retirement. Interestingly about one third of the respondents were not aware of the kind of insurance policy they owned. There was a positive correlation between not knowing the kind of policy and the social motive for buying the insurance. This particularly pointed to the low levels of financial literacy and awareness and blind faith in the insurance agent by the customer.

4.2   Literature Review

4.2.1   Insurance is a Complex Decision

Insurance products are complex and insurance decisions are difficult (Schwarcz, 2010). Risk assessment is extremely difficult and returns on investment-oriented life insurance products are highly speculative and uncertain (Ericson and Doyle, 2006). Cash value policies are abstract and complex, returns from such policies are not guaranteed upfront but realized in the future and such returns are difficult to prove (Crosby and Stephens, 1987). Crosby and Stephens further contend that whole life insurance is a credence product with sales depending on relationship marketing. Contrary to the economists' view that relationship marketing acts as a substitute for price competition, Crosby and Stephens contend that insurance policies linked to the stock market (Unit-linked Policies or ULIP) are risky instruments. Linking tax benefits with life insurance and rapid increase in the investment-oriented life insurance products have made the policy choice decision more complex for the customers (Droms and Baldwin, 1989).

It requires high levels of financial knowledge and aptitude to understand complex financial products. Many consumers make mistakes in their financial choices and poor financial decisions result in substantial financial losses to customers (Agarwal *et al.,* 2009). In general,

financial literacy is poor worldwide, even simple concepts about savings and investment such as interest compounding are not known (Lusardi, 2008; Hung *et al.*, 2009).

4.2.2   Collectivist Cultures and Influence of Insurance Agents

Classical economic theories assume that human beings are rational; they want to and are able to make decisions that maximize their utility. The underlying assumption behind rational behavior is that individuals have freedom of choice and make decisions independently. This is often true in individualistic societies. However, in collectivistic societies, the need for social acceptance may lead individuals to conform to social norms, even at the cost of sacrificing their own best interests. Individuals form their opinions based on the opinions of social leaders and rely implicitly on the word of their friends and acquaintances. They also place a lot of trust in the advice of so-called "experts" and opinion leaders. Thus, a herd mentality is often observed in their financial behavior in nations with collectivistic culture (Zhan, 2013; Eun *et al.*, 2015).

Sales agents are the primary contact persons and consumer relies on agents for finding a suitable life insurance product (Lawrence and Stephens, 1987; Anagol *et al.*, 2017). They also act as financial planners and develop a long-term bond of trust with their customers (Crosby and Cowles, 2008). Brand value of the insurance provider, high levels of trust in insurance agents coupled with low levels of financial literacy lead to an overdependence on the advice given by insurance agents.

If consumers are not well informed, the complexity of financial decisions coupled with the prevalent collectivistic culture may lead to deceptive sales practices by agents in order to gain higher commissions (Ericson and Doyle, 2006; Leah, 1986). The present accountability mechanism is not efficient in ensuring the fiduciary obligation of commission motivated sales agent. Their commissions are linked with the profitability of the company, which may not be always in the best interest of the customers (Kurland, 1996). It has been found that, independent sales agents work for multiple insurance companies (Leah, 1986); their unethical actions are affected by supervisors and sales targets (Haron *et al.,* 2011). Several authors have

found that sales agents provide poor advice and sell inappropriate insurance products to financially unsophisticated consumers (Ericson and Doyle, 2006; Anagol *et al.,* 2017; Halan *et al.*, 2014).

4.2.3   Motives for Buying Insurance

In classical economics life insurance is used for precautionary savings for smoothing future consumption and for bequest motive (Yaari, 1965; Hakansson, 1969; Fischer1973; Karni and Zilcha1986; Bernheim 1991). It is also used to increase the opportunities for borrowings (Karni and Zilcha, 1986) and lending (Hakansson, 1969).

However, life insurance is often misunderstood as an investment vehicle. Consumers expect returns on their premiums and hence think of insurance as an investment tool (Slovic *et al.*, 1977; Kunreuther and Slovic, 1978; Schoemaker and Kunreuther, 1979; Pope, 2003; Inkmann and Michaelides, 2012). People with narrow frame view life insurance as risky investments that are profitable only when returns on policies are greater than total premium paid on these policies. Individuals that are sensitive towards losing their premium in case the loss event does not occur, refuse to take insurance cover (Gottlieb, 2012; Hwang, 2016). Pope (2003) finds that life insurance is not a good choice for investment and returns on cash value policies are much lower than other available investment vehicles. Several authors propose that buying a term policy and investing the difference in a bank saving would yield a higher return than an endowment policy (Carney and Graham, 1998; Vijay and Tamilselvan, 2011; Anagol *et al.* 2017.). Studies have also found that people often view cash value policies as investments for its tax advantage feature (Winter, 1998; Hecht and Hanewald, 2010; Inkmann and Michaelides, 2012).

In India life insurance is widely used as a tool for savings and investment (Ahmad, 2013). Most of the life insurance policies sold in India are cash value policies and not pure insurance. Endowment products accounts for 87% of the total life insurance products sold in India (Halan and Sane, 2017). It was highlighted that there is potential mis-selling in Indian life insurance

market. Total loss to customers in India on account of mis-selling of life insurance was estimated to be around US $ 28 billion. It is argued that life insurance companies in India are not fair and transparent while marketing their policies. They present a false picture of life insurance policies to attract customers (Vijay and Tamilselvan, 2011). In order to gain higher commission insurance sales agents, promote endowment policies even when term policy is more suitable for a consumer. They provide poor advice and sell inappropriate insurance products to financially unsophisticated customers (Anagol *et al.,* 2017).

4.3   Research Gaps and Motivation for the Study

There have been several studies that indicate that in India cash value policies are more frequently sold than term policies. There have been some studies that have used demographic and socio-economic factors to understand the drivers of life insurance demand in India. There have also been some studies which indicate that there is considerable mis-selling of insurance by commission motivated agents. But the evidence of such mis-selling is at an aggregate level of total lapsed polices from data gathered from insurance regulatory authority.

However, there are no studies that actually try to understand the consumer behavior and the underlying motives of insurance consumers that enables such mis-selling – especially in the Indian context. This is the gap that this study aims to fill. The motivation is to understand how the choice of different kinds of insurance is influenced by one of several self-reported motives indicated by the consumer. Thus, we investigated several motives including a tax saving motive, savings and investment motive, precautionary saving motive, social influence motives etc. Specifically, we are interested in the following research questions that define the scope of this study:

- What are the socioeconomic and demographic factors that affect the choice of policy?

We expect young individuals to use life insurance for financial protection only and buy term life insurance. Middle aged and older people might use life insurance for saving and are expected to buy more endowment and multiple life insurance policies.

H1: Young individual are more likely to buy term life insurance.

H2: Older people prefer endowment and multiple life insurance policies.

Single individuals and individuals with independent children will use life insurance for financial protection and are expected to buy term policies. Married people and people with dependent children might use insurance as a tool for savings and investment and are expected to buy endowment and multiple life insurance policies.

H3: Unmarried and people with independent children have higher probability of buying term life insurance.

H4: Married people and people with dependent children are more likely to buy endowment and multiple life insurance policies as they might be using it for savings and investment.

Low income individuals will choose term policies due to high premiums of endowment policies while high income individuals are expected to buy endowment and multiple life insurance policies for tax planning and investment purposes.

H5: Income has positive effect on the purchase of endowment and multiple life insurance policy.

People with low level of education are expected to buy multiple life insurance policies due to lack of product understanding coupled with sales agents influence. We expect moderately and highly educated individuals to buy term and endowment life insurance policies.

H6: Education has negative effect on the purchase of endowment and multiple life insurance policy.

We expect students and unemployed customers to buy term life insurance because term policies are cheaper. Regular salaried and self-employed people will take endowment and multiple policies for tax saving and investments.

H7: Employment has a positive effect on the purchase of endowment and multiple life insurance policy.

- What are the reasons for taking a term policy vs. a cash value policy?
- Why do people purchase multiple life insurance policy?

Amongst the reasons for taking life insurance policies, we expect people using life insurance as a mean of saving for future need to buy endowment and multiple life insurance policies in order to achieve their future financial goals. People using life insurance as a mean of regular saving are expected to purchase endowment policies.

H8: Future saving motive has a positive influence on the purchase of endowment and multiple life insurance policies.

H9: Regular saving motive has a positive influence on the purchase of endowment policies.

Individuals are expected to take term life insurance if they are interested only in securing the future of their family. People buying life insurance under agents' influence, social pressure or to facilitate financial transactions with banks are expected to buy endowment and multiple life insurance policies.

H10: Financial protection motivation has a positive influence on the purchase of term life insurance.

H11: Social influence has a positive influence on the purchase of endowment and multiple life insurance policies.

4.4   Research Methodology

Data

The target population included existing life insurance customers who own any kind of life insurance policy. Research instrument was designed to collect information regarding customer's attitudes and behavior with regard to insurance and their satisfaction with the insurance products they had purchased. Data for the study was collected through a convenience sampling method using a structured questionnaire from different cities and villages of the country. Both online and offline modes were used to conduct the survey for data collection.

A total of 298 responses were collected which consists of 105 online and 193 offline responses. The geographic distribution of respondents was quite diverse with respondents surveyed from several cities and villages from the states of Rajasthan, Uttar Pradesh, and Uttarakhand.

Research Instrument

A questionnaire was developed to understand how people make decisions regarding the choice of insurance policy. The questionnaire was reviewed by experts in qualitative research and questionnaire designing. Pretesting was done to eliminate any discrepancy and readability issues in the questionnaire. In addition to information on respondent's demographics details, the questionnaire had several questions designed to measure customer's satisfaction toward life insurance products. Respondents were asked to provide their responses about the types of insurance policies purchased, name of the insurer, reasons for purchasing life insurance policy and level of satisfaction with insurance purchase decision.

Measurement

Level of satisfaction with insurance purchase decision were measured on five-point agreement scale, 1 indicating "Strongly disagree" and 5 indicating "Strongly agree". Reasons for purchasing life insurance were measured on importance scale, 1 indication "Not Important" and 5 indicating "Very Important".

Logistic Regression Models

Logistic regression models were built in order to analyses the relationship between reasons for purchasing life insurance policies and choice of life insurance policy. Decision to purchase term policy, endowment policy and multiple policies are represented in the equations (4.1), (4.2) and (4.3) below. *Term* is a binary variable which takes a value of 1 if the respondent owns a term life insurance 0 otherwise. Endowment is a binary variable which equals to 1 if respondents own an endowment plan and 0 otherwise. And Multiple is a binary variable which is equal to one for the respondents who have bought multiple life insurance policies and 0 otherwise.

$$Term = \beta 0 + \beta 1(R1) + \beta 1(R1) + \beta 2(R2) + \beta 3(R3) + \beta 4(R4) + \beta 5(R5) + \beta 6(R6) +$$
$$\beta 7(R7) + \beta 8(Age\_Group) + \beta 9(Gender) + \varepsilon \qquad \text{Equation (4.1)}$$

$$Endowment = \beta 0 + \beta 1(R1) + \beta 1(R1) + \beta 2(R2) + \beta 3(R3) + \beta 4(R4) + \beta 5(R5) +$$
$$\beta 6(R6) + \beta 7(R7) + \beta 8(Age\_Group) + \beta 9(Gender) + \varepsilon \qquad \text{Equation (4.2)}$$

$$Multiple = \beta 0 + \beta 1(R1) + \beta 1(R1) + \beta 2(R2) + \beta 3(R3) + \beta 4(R4) + \beta 5(R5) + \beta 6(R6) +$$
$$\beta 7(R7) + \beta 8(Age\_Group) + \beta 9(Gender) + \varepsilon \qquad \text{Equation (4.3)}$$

The independent variables R1, R2, R3……R7 used in Equations (4.1) – (4.3) represent different reasons for purchasing life insurance policies which are defined as follows:

R1-To save for future needs like children's education & retirement.

R2-To save some amount regularly so that I don't spent it all

R3-It helps to secure the future of my family in case of death.

R4-To save income tax.

R5-The life insurance agents convinced me that I should take a policy.

R6-Life insurance purchase was needed in order to get some loans/services from the bank.

R7-Knowing the life insurance agent socially, I felt a social obligation to invest in an insurance policy.

Age group is a categorical variable 0 for age group 25-34(base category), 1 for age group less than 18 years, 2 for age group 18-24, 3 for age group 35-44, 4 for age group 45-55 and 5 if respondent is above 55 years of age. Gender is a binary variable 1 for a female respondent and 0 for male.

4.5   Results

First, we discuss the characteristics of life insurance policy holders in our sample. Life insurance policy-wise details of the insured individuals are presented in Table 4.1. In our sample most of the individuals own cash value policies including Unit Linked Insurance (ULIP). Almost equal numbers of individuals own term life and multiple life insurance policies, 23 percent and 22 percent of the sample, respectively. Surprisingly, largest fraction of our sample (30 percent respondents) was not aware of the kind of life insurance policy they own. This reflects the poor understanding of life insurance products in India.

Table 4.1 Ownership Details of Different Life Insurance Policies

Type of Policy	No of owners in the sample	Percentage
Term Life Policy	68	23%
Cash Value Policy	74	25%
Multiple Policies	66	22%
Unaware	90	30%
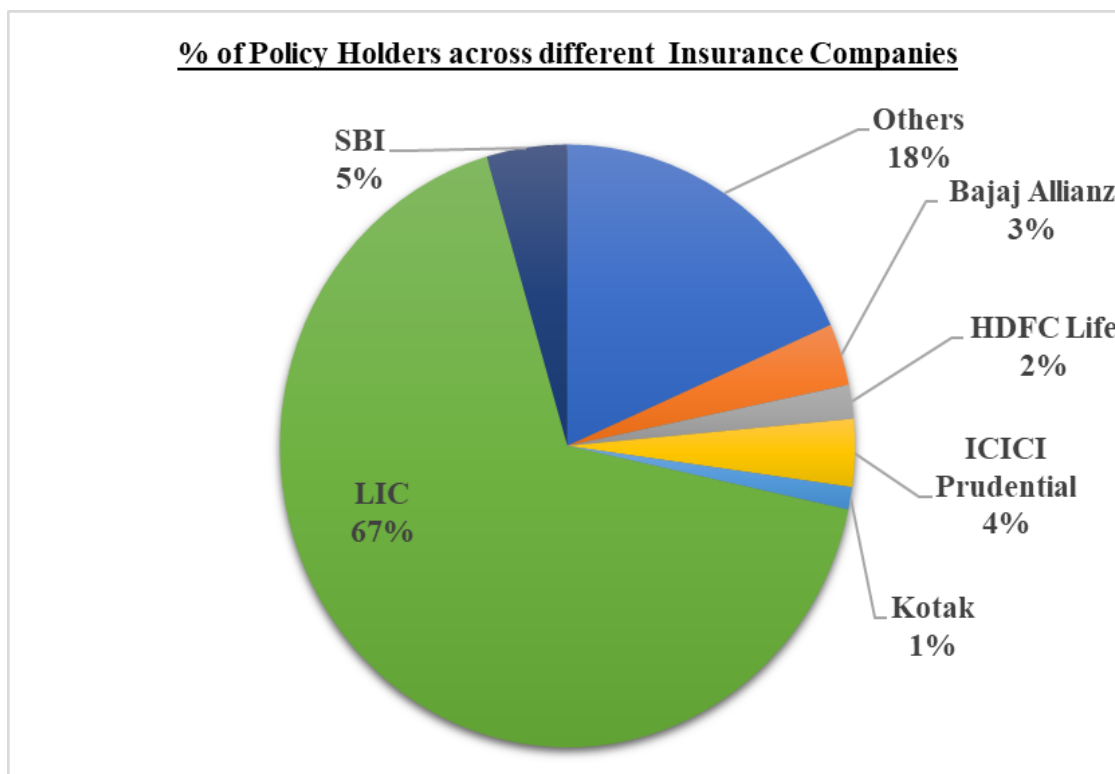
Figure 4.1 Distribution of Life Insure Policy Holders across different Insurance Providers

Distribution of 298 policy owners across different life insurance providers is shown in Figure 4.1. In terms of choice of life insurance providers, Life Insurance Corporation of India (LIC) is the first choice of insurance buyer's. Most of the respondents (67 %) are insured with LIC followed by SBI Life (5%), ICICI Prudential (4%) and Bajaj Allianz (3%). This shows the dominance of LIC over other insurance Providers.

The distribution of ownership of different kind of life insurance policies in different demographic groups is presented in Table 4.2. We see that term policies were typically owned by respondents in the age group 25-34 while multiple policies were owned by individuals aged between 34-45 years. Term policies were owned by individuals with somewhat lower monthly income while multiple policies were owned by richer individuals. In terms of educational

qualifications and occupation, there were no differences between those who owned term, endowment or multiple policies.

Most term life insurance owners have monthly income between Rs. 25000-50000. For cash value policies distribution of policy holders is almost equal across different income categories except the highest income category. Respondents belonging to highest income category i.e. above Rs 100000 own multiple life insurance policies. Among individuals with a bachelor's and master's degree, the ownership percentages of term and endowment life insurance are almost similar. Most of the respondents that have taken multiple policies have acquired masters/ professional degree. Most of the respondent's that own either term life, endowment or multiple policies are salaried but the largest fraction of salaried respondents own multiple life insurance policies.

Table 4.2 Demography-wise Distribution of Different Kinds of Life Insurance Policies

	Term Policies		Endowment Policies		Multiple Policies	
Age						
Under 18 years	0	0%	0	0%	1	2%
18-24 years	5	7%	2	3%	2	3%
25-34 years	26	38%	34	46%	19	29%
35-44 years	15	22%	19	26%	26	39%
45-55 years	13	19%	15	20%	17	26%
Above 55 years	9	13%	4	5%	1	2%
Income						
Less than Rs 10000	9	13%	16	22%	1	2%
10000-25000	11	16%	16	22%	7	11%
25001-50000	23	34%	16	22%	19	29%
50001-100000	9	13%	14	19%	10	15%
More than Rs 100000	14	21%	7	9%	24	36%
Not disclosed	2	3%	5	7%	5	8%
Education						
Less than 10th	2	3%	7	9%	0	0%
10-12th	5	7%	7	9%	1	2%
Bachelor	24	35%	25	34%	19	29%
Master/Professional	28	41%	28	38%	35	53%
Doctorate	9	13%	7	9%	11	17%
Employment						
Student	6	9%	7	9%	5	8%
Looking for work	4	6%	7	9%	0	0%
Homemaker	4	6%	4	5%	3	5%
Employed/Salaried	39	57%	40	54%	49	74%
Self-Employed	14	21%	14	19%	8	12%
Retired	1	1%	2	3%	1	2%

4.5.1 Demographic Factors as Determinants of Policy Choice

We wanted to understand whether demographic factors had a significant effect on policy choice. For this purpose, we built logistic regression with three different dependent variables indicating whether the respondent had a term policy or had an endowment policy or had multiple policies.

Dependent Variable: Probability of owning a Term Policy / Endowment Policy / Multiple Policies

Independent Variables:

- Age categories - <18, 18-24, 25-34, 35-44, 45-55, Above 55

- Gender – Male / female

- Family status – Single, married without children, family with dependent children, family with independent children

- Income categories - < Rs. 10,000 pm; Rs 10,000– Rs. 25,000; Rs 25,000-Rs. 50,000 pm; Rs. 50,000-Rs 1,00,000 pm

- Education categories – Non-matriculate, Matriculate, Bachelor's degree, Professional / master's degree, Doctorate degree

- Occupation categories – student, looking for work, homemaker, salaried, self-employed, and retired.

The results of these models have been given in Table 4.3. These have been discussed below.

Term Policy: We find that the only two variables were statistically significant were age and occupation status. Older people more than 55 years old had a higher probability of owning term insurance while retired people had a lower probability.

Table 4.3 Demographic Factors Affecting Choice of Policy – Results of Logistic Regression Models

	Term Policy			Endowment Policy			Multiple Policy		
	Estimate	p value		Estimate	P value		Estimate	P value	
(Intercept)	-2.542	0.017	*	-0.256	0.756		-19.839	0.993	
AGE_Group<18 years	-13.687	0.989		-14.573	0.988		18.452	0.991	
AGE_Group 18-24 years	-0.220	0.734		-1.757	0.039	*	-0.693	0.446	
AGE_Group 35-44 years	-0.561	0.207		-0.672	0.101		0.816	0.099	.
AGE_Group 45-55 years	-0.131	0.792		-0.178	0.699		0.383	0.489	
AGE_Group above 55 years	1.808	0.024	*	-0.711	0.433		-18.367	0.995	
Female	0.022	0.956		-0.090	0.824		-1.098	0.017	*
Married without children	-0.184	0.770		1.169	0.037	*	-0.886	0.242	
Family with dependent children	0.039	0.936		0.583	0.239		-0.225	0.682	
Family with independent children	0.500	0.534		-0.215	0.815		0.265	0.773	
10th/ 12th	0.571	0.570		-0.760	0.286		-0.638	1.000	
Bachelor's degree	1.254	0.177		-0.425	0.505		16.708	0.994	
Professional/Master's degree	1.324	0.165		-0.629	0.341		16.992	0.994	
Doctorate degree	1.431	0.169		-0.330	0.679		16.833	0.994	
Looking for work	0.096	0.909		0.045	0.956		-16.137	0.993	
Homemaker	0.385	0.667		-0.267	0.770		0.469	0.663	
Salaried	-0.151	0.799		-0.477	0.433		0.273	0.686	
Self-employed	0.406	0.549		-0.524	0.448		-0.016	0.984	
Retired	-3.023	0.035	*	0.074	0.955		18.150	0.995	
Income 10000-25000	0.185	0.745		0.184	0.717		1.310	0.247	
Income 25001-50000	0.654	0.253		-0.139	0.800		2.113	0.053	.
Income 50001-100000	-0.028	0.966		0.352	0.550		1.734	0.123	
Income >100000	0.174	0.784		-0.822	0.211		2.661	0.017	*
Would rather not say	-0.465	0.616		0.597	0.434		2.763	0.027	*
AIC:	341.52			352.90			285.78		

Endowment Policy: Age and family status were statistically significant variables for endowment policy ownership probability. Younger people were less likely and married individuals without children were more likely to own endowment policies. This indicates that endowment policies are actually not being used for bequest motives.

Multiple Policies: Age, gender and income status were all statistically significant variables that affected the probability of owning multiple policies. Individuals in the age range of 35-44 years (the prime earning years) were more likely to own multiple policies. Women were less likely to own multiple policies. The probability was positively correlated with income level of the insured individual.

4.5.2   Reasons for Purchasing Life Insurance Policies

To understand whether there are some common patterns among the different reasons for purchasing life insurance policies, we performed an exploratory factor analysis on 7 reasons for purchasing life insurance. Results of the factor analysis are given in Table 4.4. Reasons R1, R2 and R3 are loading on factor 1 whereas R4, R5, R6 and R7 are loading on factor 2.

R4 among other has a low loading (less than 0.5), after discarding R4 we identified these two factors as "Saving and Investment motives" and "Social Pressure". Results of the factor analysis suggest that people buy life insurance policies either for saving and investment or under social pressure.

Table 4.4 Results of the Factor Analysis on Reasons for Taking Life Insurance

		Factor 1	Factor 2
		Saving and Investment	Social Pressure
R1	To save for future needs like children's education & retirement.	0.841	0.063
R2	To save some amount regularly so that I don't spent it all	0.751	0.135
R3	It helps to secure the future of my family in case of death.	0.676	0.004
R4	To save income tax	0.249	0.459
R5	The life insurance agents convinced me that I should take a policy.	0.088	0.704
R6	Life insurance purchase was needed in order to get some loans/services from the bank.	0.117	0.707
R7	Knowing the life insurance agent socially, I felt a social obligation to invest in an insurance policy.	-0.213	0.792

To analyze how these two factors affect the choice of life insurance policies, we built three logistic models where the factor scores of factor analysis results were taken as the independent variables. Logistic regression results are shown in Table 4.5. Results suggest that when savings and investment reasons are considered together, people with savings and investment motives are less likely to take a term insurance policy. Social pressure does not influence the choice of a term life policy. Choice of an endowment policy is not affected by social pressure while saving and investment motives positively influence the purchase of endowment policy. Interestingly, purchasing multiple life insurance policies are not affected by saving and investment motives but Social pressure promote the purchase of multiple life insurance policies.

Table 4.5 Effect of Investment Motives vs. Social Motives on Choice of Life Insurance

	Term Policies			Endowment policies			Multiple Policies		
Variables	β	P value	Sig.	β	P value	Sig.	β	P value	Sig.
(Intercept)	-1.246	<2e-16	***	-1.122	<2e-16	***	-1.277	<2e-16	***
Saving and Investment	-0.310	0.02	**	0.239	0.090	*	0.069	0.626	
Social Pressure	0.077	0.58		-0.022	0.869		0.257	0.059	*

4.5.3   Motives for Purchasing Term Policies

We were interested in the way specific reasons affected the probability of purchasing a term policy. The results of the logistic regression for taking term life insurance are shown in Table 4.6. We find that people are not buying term life insurance for risk mitigation. Individuals wanting to buy insurance for future needs such as children's education and retirement are less likely to buy term insurance. Most individuals who purchase term insurance seem to be doing it for the purpose of getting a tax shelter[17]. People are less likely to buy a term life insurance product under social pressure. We find that age and gender does not affect the choice of a term life insurance policy.

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[17]Any policy holder of life insurance is eligible to receive tax benefits as per the Income Tax Act 1961. Typically, all insurance policies offer customers tax deductions under Section 80C of the Income Tax Act, 1961, along with further deductions up to an amount of Rs 1.5 lakhs. Source: https://www.incometaxindia.gov.in/Charts%20%20Tables/Deductions.htm

Table 4.6 Term Life Policy Purchase Motives - Logistic Regression Results

Variables	Estimate	P-value	Sig.
(Intercept)	0.027	0.971	
R1 - To save for future needs like children's education & retirement.	-0.265	0.065	.
R2 - To save some amount regularly so that I don't spent it all	-0.231	0.110	
R3 - It helps to secure the future of my family in case of death.	-0.068	0.642	
R4 - To save income tax	0.253	0.039	*
R5 - The life insurance agents convinced me that I should take a policy.	0.038	0.774	
R6 - Life insurance purchase was needed in order to get some loans/services from the bank.	0.208	0.126	
R7 - Knowing the life insurance agent socially, I felt a social obligation to invest in an insurance policy.	-0.232	0.098	.
AGE_Group 18-24	-0.411	0.465	
AGE_Group 35-44	-0.527	0.171	
AGE_Group 44-55	-0.164	0.692	
AGE_Group above 55	0.747	0.154	
Gender1	0.250	0.481	
AIC	318.16		

4.5.4 Motives for Purchasing Endowment Policies

Results of the logistic model for purchasing endowment policies (cash value policies) are given in Table 4.7. Our results indicate that endowment policies are being used for regular savings. Using insurance as a mean of family security as well as saving for future needs does not have significant effect on choice of an endowment policy. People belonging to age group 25-34 are more likely to buy endowment policies as compared to age groups 18-24 and 35-44. Gender does not have a significant effect on purchasing of endowment policies.

Table 4.7 Endowment Policy Purchase Motives - Logistic Regression Results

Variables	Estimate	P-value	Sig.
(Intercept)	-2.02	0.01	*
R1 - To save for future needs like children's education & retirement.	-0.16	0.26	
R2 - To save some amount regularly so that I don't spent it all	0.32	0.03	*
R3 - It helps to secure the future of my family in case of death.	0.23	0.14	
R4 - To save income tax	0.03	0.78	
R5 - The life insurance agents convinced me that I should take a policy.	-0.03	0.79	
R6 - Life insurance purchase was needed in order to get some loans/services from the bank.	-0.12	0.39	
R7 - Knowing the life insurance agent socially, I felt a social obligation to invest in an insurance policy.	0.01	0.93	
AGE_Group 18-24	-1.91	0.01	*
AGE_Group 35-44	-0.67	0.05	.
AGE_Group 44-55	-0.25	0.51	
AGE_Group above 55	-0.97	0.11	
Gender1	-0.07	0.84	
AIC	206.81		

4.5.5 Motives for Purchasing Multiple Policies

Logistic regression results for taking multiple life insurance policies are shown in Table 4.8 below. Results show that people take multiple life insurance policies for achieving their specific financial goals such as children's education and retirement planning. We find that influence of banks and insurance agents are both causal factors in the purchase of multiple life insurance policies. All age group people are likely to purchase multiple policies except the age group 18-24 and older people above 55 years of age. Males buy more multiple policies as compared to females.

Table 4.8 Multiple Policy Purchase Motives - Logistic Regression Results

Variables	Estimate	P-value	Sig.
(Intercept)	-3.02	0.00	***
R1 - To save for future needs like children's education & retirement.	0.27	0.09	.
R2 - To save some amount regularly so that I don't spent it all	-0.34	0.03	*
R3 - It helps to secure the future of my family in case of death.	0.13	0.44	
R4 - To save income tax	0.25	0.05	.
R5 - The life insurance agents convinced me that I should take a policy.	-0.28	0.07	.
R6 - Life insurance purchase was needed in order to get some loans/services from the bank.	0.29	0.04	*
R7 - Knowing the life insurance agent socially, I felt a social obligation to invest in an insurance policy.	0.30	0.04	*
AGE_Group 18-24	-1.36	0.10	.
AGE_Group 35-44	0.65	0.08	.
AGE_Group 44-55	0.61	0.14	
AGE_Group above 55	-1.49	0.17	
Gender1	-0.60	0.12	
AIC	296.11		

4.6   Discussion

In this chapter, the primary research question investigated was the factors that affect the choice of policies between term, endowment and multiple policies. Among demographic factors, we find that age, income and family status were significant predictors of choice of policy. We then researched the effect of different purchase motivations on the kind of policy purchased. Using logistic regression models, we find that term policies were mostly bought for tax savings purposes. Endowment policies were bought for bequest motives and not for specific financial goals like children's education or retirement. Thus, endowment policies are being thought of as pure insurance. Multiple policies are being bought to meet specific financial goals and also because of social influence by agents and banks.

Our results show that, as we had expected older individuals are more likely to buy term life insurance while younger households are less likely to buy endowment policies. But we did not find any significant influence of age on the choice of multiple life insurance policies. Contrary to what we had expected we did not find any significant effect of marital status on the choice of term and multiple policies. But we find that married individual without children are more likely to buy endowment policies. We also find that people in high income group are more likely to purchase multiple life insurance policies this finding is in line with what we had expected.

As we had expected people are more likely to buy endowment and multiple policies if they want to save regularly or to meet their future financial goal. Interestingly, people are more likely to take term policies for tax planning. This is quite strange because as term policies have lowest premiums these policies provide very low tax benefits. This reflects low financial knowledge and poor product understanding among Indian life insurance buyers.

Results show that people buy endowment and multiple policies under social pressure and under the influence of financial intermediaries. This again points towards the importance of social groups and insurance sales agent in life insurance decisions among Indians. This also suggest that there is lack of awareness and understanding among life insurance buyers and possible mis selling by insurance sales agents and financial intermediaries like banks.

Limitation of the Study: One of the Interesting finding of the study is that financial literacy and product understanding has an important role in life insurance purchase decision. We could not study the effect of financial knowledge / Financial literacy separately. This was a limitation of the study and can be addressed in future research.

Chapter 5. Factors Affecting Lapsation of Policies

5.1 Introduction

An insurance policy lapses when the policy holder does not continue regular payment of the insurance premium and hence the contract between the insured and the insurer comes to an end before policy maturation. Lapsation of insurance policies results in losses to the insured as well as to the insurer. Most life insurance policies are front loaded - i.e. as the policy matures, the benefits of being insured accrue to the insured. In the early part of the policy duration, premium payments exceed the actuarially fair value of the risk insured. In the later part of the policy period, the premium payments are less than the actuarially fair value (Fang and Kung, 2012).

Early lapsation leads to the insured person losing the insurance coverage even though she has already made some premium payments. The insurance company faces a greater loss due to early lapsation since the premiums earned do not offset the cost of acquiring the customer (through sales commissions to agents and advertising costs etc.) In cases of late lapsation, where the insurance lapses after several years of premium payment, the insured person faces heavy losses. The insurance company, however, is in an advantageous position since it has already earned most of the premiums and does not have the liability of claim settlement. Thus, they earn "lapsation profits" which are factored in the pricing of the insurance policies (Fang and Kung, 2012).

Lapsation may indicate that the policy was not effective in meeting the specific needs of the insured person. Insurance policies may lapse due to passive non-action or active decisions. Passive reasons for lapse include facts such as customers not being aware that not paying the premium on time will lead to lapsation (lack of information), or their forgetting to pay the premium (bounded rationality with time constraints or attention constraints). Active lapsation occurs when they chose not to pay the premium because they feel that they do not need the insurance coverage. Active lapsation of insurance coverage may be indicative of the fact that

the policy was not needed in the first place and may have been bought due to aggressive selling tactics of the insurance agents. The insured person may give in to such selling tactics initially but then retracts his position later with minimum loss – this is a delayed and indirect rejection of the product.

There also exists a secondary market for insurance (Fang and Kung, 2012) where the insured person may opt for "immediate settlement" before the policy matures with a third party. The third party then owns the life insurance policy and would collect from the insurance company in the event that the insured person dies before the policy matures. The existence of the secondary market effectively erases any lapsation profits that may have otherwise ensued to the insurance company.

Insurance customers may "shop around" for better deals in case they feel that the premiums are too high or the coverage is not adequate. Lapsation of policies (especially when there is no policy replacement) is indicative of an erosion of consumer trust in the insurance market. While it may lead to higher profits for insurance companies in the short term, it reduces the efficiency of the insurance market in the long term. Increased consumer costs lead to lower participation of consumers in the future resulting in lower insurance penetration. This is a serious issue that needs to be considered by policy makers who are concerned with the wellbeing of consumers.

While there have been several studies that look at overall lapse rates from aggregate industry data, there have been few studies of factors affecting individual decisions to lapse a policy. It is important to understand the reasons underlying such behaviour. This research gap is addressed in this study. We explore individual reasons for lapsation using primary data, gathered from a sample of 289 respondents in north India. In particular, we were interested in understanding the stated reasons for lapsation. We are also interested in finding out whether the original stated motives for purchasing insurance had any bearing on the lapsation of the policy. It must be clarified that the focus of this study is not the costs of lapsation to consumer wellbeing, but the underlying behavioural factors that result in lapsation. In particular, we set out to investigate the fact that lapse rates are primarily indicative of mis-selling as reported by Halan *et al.,* 2014.

 Our results suggest that the incidence of lapse is high with almost one third of the respondents reporting that their policy had lapsed. The primary cause for the insurance policy lapsation is the perception among the insured that the insurance policy did not meet their needs or the reason for purchase of the insurance policy is not relevant any more. Among the socio-economic and demographic factors that affected lapsation, we find that income has the largest effect followed by un-employment status. If insurance was purchased to help in saving taxes, it was less likely to lapse. If the customer was convinced to buy insurance by the insurance agent, the chances of lapsation are higher. Lack of knowledge of the kind of insurance policy owned (either due to low financial knowledge or due to lack of interest and customer engagement) also led to high lapsation rates.

5.2   Literature Review

Eling and Kochanski (2013) provide a comprehensive review of the extant literature on lapse of insurance policies. They provide a structured review of 44 papers that have looked at lapse rate modelling and 12 empirical papers. They conclude that while there have been several studies that have looked at overall lapse rates in the insurance industry, there have been few studies that look at individual decision making and looking at the "why" behind the lapse decision especially as it applies to specific individuals. This study aims to fill that gap in the literature.

5.2.1   Causes of Policy Lapsation

Several hypotheses have been proposed as underlying causes of lapsation. The most ones that have been researched most often in the literature are 1) Emergency Fund Hypothesis (EFH), (2) Interest Rate Hypothesis (IRH) and (3) Policy Replacement Hypothesis (PRH).

The "emergency fund hypothesis" (Outreville, 1990; Kim, 2005) suggests that, in a situation of financial hardship it may be difficult for a policyholder to pay premium for maintaining the insurance policy which may result in policy lapse. Policy holder can use the cash values of the

policy to meet their important financial expenses. Belaygoros *et al.* (2014) estimated models for lapse rates using a Bayesian Multiple-Block Gibbs sampling method. They found strong evidence in support of the emergency fund hypothesis. Fier and Liebenberg (2012) studied life insurance lapse behaviour at the household level. They found that voluntary lapses are related to large income shocks lending support to the emergency fund hypothesis. They also found that the decision to lapse a life insurance policy was directly related to the purchase of a different life insurance policy, which supports the policy replacement hypothesis. In an interesting and comprehensive study, Gottlieb and Smetters (2016) proposed a model of lapsation based on the assumption that insurance consumers do not anticipate changes in their liquidity requirements in the near future. Their model was tested with policy data from two major insurers in the US. They found that their proposed model fit the actual lapse data better than competing hypotheses of lapsation: such as reclassification risk, hyperbolic discounting and administrative costs. One of the interesting findings of their study was that lapsation profits seem to peak when the policy is active for about 8 years (within a total 20-year maturity period).

According to the "interest rate hypothesis" (Schott, 1971; Pesando, 1974; Kuo *et al.*, 2003), when market returns are higher than returns on insurance policy, policyholder may discontinue the insurance policy and invest the amount in the market for better returns. Outreville (1990) found that ordinary life insurance that lapses within 13 months of issue (early lapsation) is not related to interest rates fluctuations but rather to changes in the expected personal income.

The "policy replacement hypothesis" (Russell *et al.*, 1997; Carson and Forster, 2000) argues that policies may lapse when policyholders want to replace the current policy with a better policy available in the market. Carson and Forster (2000) use an analytical tool (marginal yield analysis) to provide some insights into the life insurance replacement decision. They find that for a sample of whole life contracts, up to 93% of policies should not be replaced during policy years 4 through 10.

5.2.2 Empirical Research on Microeconomic Factors affecting Policy Lapsation

Literature on microeconomic determinants of life insurance lapse is limited. Fang and Kung (2012) studied policyholder's characteristics and found that; life insurance policy lapse is related to the choice of policy. They argue that, for older individual income shocks and bequest shocks have stronger effect than policy choice shocks. Mulholland and Finke (2014) showed that, life insurance policy lapse decisions are affected by policy holder's cognitive ability. Economically well-off individuals are less likely to lapse while recently retired individuals have high probability of lapse.

Mahdavi and Abed (2015) investigated the effect of risk aversion on policy lapsation in Iran. They used age, gender and marital status as risk aversion proxies and find that these significantly affect the lapsation of life insurance policies. They concluded that individuals that have low levels of risk aversion were more likely to lapse their policies.

Nolte and Schneider (2017) used panel data from the SAVE program in Germany to understand the effect of several behavioural factors on surrender of insurance. The behavioural factors they considered included reliance on heuristics, financial literacy, financial advice as well as interaction effects between these. They included several demographic and socio-economic variables as controls.

5.2.3 Mis-selling and Lapsation of Policies – Evidence from India

Halan *et al.* (2014) used the data on lapsation of policies and concluded that lapsation may be indicative of the fact that unit liked insurance policies (ULIP) are being mis-sold. Shubashini and Velmurugan (2012) argued that, mis- selling and high insurance premiums are the primary reasons for life insurance policy lapse in India. Padmavathi (2014) contends that the front-loading remuneration structure for insurance agents incentivizes them to acquire new clients but does not incentivize them to pursue old customers to renew their policies. In the absence of an inherent need for the insurance, this kind of selling practices leads to high lapsation rates. Nithiyalakshmi *et al.* (2016) used a tool called Combined Block Fuzzy Cognitive Maps to

understand the primary cause of lapsation. They concluded that mis-selling of insurance is the root cause that drives lapsation of policies.

Mall and Sahoo (2012) found that life insurance policy lapse is related to policy characteristics such as sum assured, policy type and policy duration as well as policyholder's characteristics such as age, occupation and marital status. They find that the probability of the policy lapsing is higher if the policy holder is young, less educated, married or does not have a salaried position and if the beneficiary is not closely related to the insured person. In terms of policy characteristics, the insurance being a term plan, outstanding premiums to be paid being high, and payment mode of premium being several times a year and duration to maturity being high, increased the probability of lapsation.

5.3   Motivation for the Study and Research Questions

The lapse rate of insurance policies is high as reported by Halan and Sane, 2014 and several other authors. We were interested in finding out the primary reasons of lapsation in India. This was the motivation for this study. We were primarily interested in the following research questions:

- Do the demographic and socio-economic characteristics of the insured person affect lapsation?

We use demographic characteristics of the respondents to predict life insurance policy lapse. We use demographic characteristics to understand who are the people that purchase life insurance and then let their policies to lapse. We expect younger and unmarried individuals to have higher probability of lapse. As people grow older and start taking family responsibility they are expected to take well thought out and better investment decisions.

H1: Age has a negative effect on life insurance lapse.

H2: Marital status has a negative effect on insurance lapse.

Respondents in lower income categories are expected to have higher lapse rates due to unaffordability of insurance premium. Less educated individuals are also expected to have higher lapse rate due to poor product knowledge and selection of inappropriate life policy.

H3: Household income has a negative effect on insurance lapse.

H4: Head's education has a negative effect on insurance lapse.

- Is lapsation rate different for different kinds of insurance policies purchased?

Amongst the kind of life insurance policies, we expect endowment and multiple life insurance policies to have higher probability of lapse due to high premiums and low return on these policies.

H5: Endowment and multiple life insurance policies have high probability of lapse as compared to term policies

- Do the original motives for purchasing insurance (financial / social) affect the lapsation rate, indicating possible mis-selling of insurance?

We use purchase motivations to predict policy lapse in order to understand which purchase motivations leads to life insurance policy lapse. This would allow us to understand whether the life insurance policies are lapsing due to the selection of inappropriate policy, lack of understanding of insurance products or mis-selling. We expect life insurance products purchased for investment or future financial planning to have higher probability of lapse. Because life insurance products are not appropriate for investment and financial planning as they yield low return. Once customer realize this they are expected to let their policy lapse.

H6: Purchasing life insurance for savings and investment purposes have positive effect on policy lapse.

We also expect policies bought under social pressure or under the influence of sales agents to have higher chances of lapse.

H7: Purchasing life insurance under social and financial intermediaries' influence positively affect policy lapse decision.

5.4   Research Methodology

A questionnaire was developed for the data collection with the help of focus groups with insurance customers, literature review and expert advice. Using convenient sampling 389 responses were collected from 20 villages and 22 cities across India. About 289 of these respondents had purchased life insurance policies which we include in this study. Both online and offline modes were utilized for the data collection. The final sample includes 105 online and 184 offline responses. In addition to questions about the demographic and socio-economic information, the respondents were asked several questions regarding the reasons why they bought the insurance, whether their insurance had ever lapsed and if it had lapsed, then what were the reasons that the policy had lapsed.

Reasons for purchasing life insurance were measured on importance scale, 1 indication "Not Important" and 5 indicating "Very Important". For policy lapse reasons respondents were asked to choose from a list of reasons as has been given in questionnaire (Appendix – G)

We first analysed the reasons for lapse by collating the text, counting the number of times each reason had been mentioned and building a pie chart.

Next, we built a logistic regression model to understand the factors that affect the probability of the policy lapsing. A dummy variable was created which took a value of 1 for all the respondents who indicated that their policy had lapsed, and 0 otherwise. This was the dependent variable in our regression model. In the first model, we used several demographic variables as independent variables. In the next model, we used the reasons for taking insurance as well as the kind of insurance purchased as independent variables. Specifications of the regression models are given below. The results of our analysis have been given in the next section.

$$Lapse = \beta0 + \beta1(Age_{Group}) + \beta1(Gender) + \beta2(Marital_{Status}) + \beta3(Education) +$$

$$\beta4(Employment) + \beta5(Income) + \varepsilon \hspace{3cm} \text{Equation (5.1)}$$

$$Lapse = \beta0 + \beta1(R1) + \beta1(R1) + \beta2(R2) + \beta3(R3) + \beta4(R4) + \beta5(R5) + \beta6(R6) +$$

$$\beta7(R7) + \beta8(Policy) + \varepsilon \hspace{3cm} \text{Equation (5.2)}$$

Where, age group is a categorical variable: 0 for age group 25-34(base category), 1 for age group less than 18 years, 2 for age group 18-24, 3 for age group 35-44, 4 for age group 45-55 and 5 if respondent is above 55 years of age.

Gender is a binary variable 1 for a female respondent and 0 otherwise.

Marital Status is measured as: 1 for unmarried, 2 for married without children, 3 for family with dependent children and 4 for family with independent children.

Education: 1 for non- matriculate, 2 for 10th/ 12th, 3 for bachelor's degree, 4 for professional/Master's degree and 5 for doctorate degree.

Employment category: 1 for students, 2 for looking for work, 3 for homemaker, 4 for salaried, 5 for self-employed and 6 for retired.

Income category: 1 for less than Rs. 10000, 2 for Rs 10,000-25,000, 3 for Rs. 25,000-50,000, 4 for Rs. 50,001-100,000, 5 for More than 100,000 and 6 for Would rather not say.

Variables R1, R2, R3……R7 represent different reasons for purchasing life insurance policies which are defined as follows:

R1-To save for future needs like children's education & retirement.

R2-To save some amount regularly so that I don't spent it all

R3-It helps to secure the future of my family in case of death.

R4-To save income tax

R5-The life insurance agents convinced me that I should take a policy.

R6-Life insurance purchase was needed in order to get some loans/services from the bank.

R7-Knowing the life insurance agent socially, I felt a social obligation to invest in an insurance policy.

Policy: It is a categorical variable that indicate the type of life insurance policy respondent own. Here, 1 indicate term policy, 2 indicate children's plan, 3 indicate retirement policy, 4 ULIP plan, 5 if policy type was unknown and 6 if respondent had purchase multiple policies

5.5 Results

Table 5.1 describes the policyholder's characteristics that have reported lapse life insurance. As we can see, about 102 respondents (out of a total of 289) reported that their policy had lapsed. Most of that respondent's that have reported lapse are male; they belong to age group 18-44.

Most of the respondents with lapse policies have dependent children followed by unmarried individuals. Education wise most of the respondents with lapse policies have a professional or master's degree followed by bachelor's degree and education up to 12th grade. Most respondents that have reported lapse of policies are employed, followed by unemployed and self-employed individuals. Interestingly, most of the life insurance policies lapse among lowest income group i.e. below rupees 10000 followed by income group 10000-25000.

Table 5.2 provides details of life insurance policies owned by individuals that have reported that their policies lapsed. It is interesting to note that about 40 % of the respondents whose insurance had lapsed did not know the type of life policy they owned. This indicates that most of the policies lapse among those who don't have knowledge and information regarding life insurance. Another interesting finding is that about 20% individuals that reported lapse hold multiple life insurance policies.

Table 5.1 Percentage of Lapsed Insurance Policies among Different Demographic Segments

Gender	Lapsed Frequency	Non-Lapsed Frequency	Percentage Lapsed
Males	81	150	35.1%
Females	21	46	31.3%
Age			
Under 18	1	1	50.0%
18-24	14	14	50.0%
25-34	38	63	37.6%
35-44	35	55	38.9%
45-55	8	47	14.5%
above 55	6	16	27.3%
Marital Status			
Single	31	41	43.1%
Married without children	7	18	28.0%
Family with dependent children	61	118	34.1%
Family with independent children	3	19	13.6%
Education			
Non-Matriculate	12	6	66.7%
10th/12th	19	20	48.7%
Bachelor's Degree	26	69	27.4%
Professional/Master's Degree	36	78	31.6%
Doctorate	9	23	28.1%
Employment Status			
Students	7	21	25.0%
Looking for work	20	3	87.0%
Homemakers	4	12	25.0%
Employed/Salaried	50	118	29.8%
Self Employed	19	34	35.8%
Retired	2	8	20.0%
Income			
Less than 10,000	40	16	71.4%
10,000-25,000	18	40	31.0%
25,000-50,000	14	56	20.0%
50,001-100,000	10	33	23.3%
More than 100,000	14	41	25.5%
Would rather not say	6	10	37.5%

5.5.1   Duration of Policy Lapse:

Percentage of policies lapsing in different duration from the date of purchase, are shown in Figure 5.1. About 45% policies were lapsed after 6 years of purchase while 24 % policies lapsed within a year of purchasing. Cumulative percentage of policies lapsing within 3 years of purchase comes out to be 39%. About 13% respondents do not remember how long they had their policies before their policies lapsed.

These numbers show that either a policy lapses very early, within 3 years of purchase or it remains in force till 6 years which is a significant duration. This may be because generally, there is a lock in period of 3 years during which a policy cannot be surrendered, these policy holders might be thinking of surrendering their policies so that they can at least get some return on their premiums. We could not collect information regarding reasons for these behaviours but it would be interesting to further explore the reasons for such behaviours.

Table 5.2 Types of Life Insurance Owned Among those that have Reported Policy Lapse

Policy Owned	Frequency
Term Policy	15
Endowment Policy	10
Children's Plan	6
Retirement Policy	3
ULIP	4
Unknown	43
Multiple Policies	21
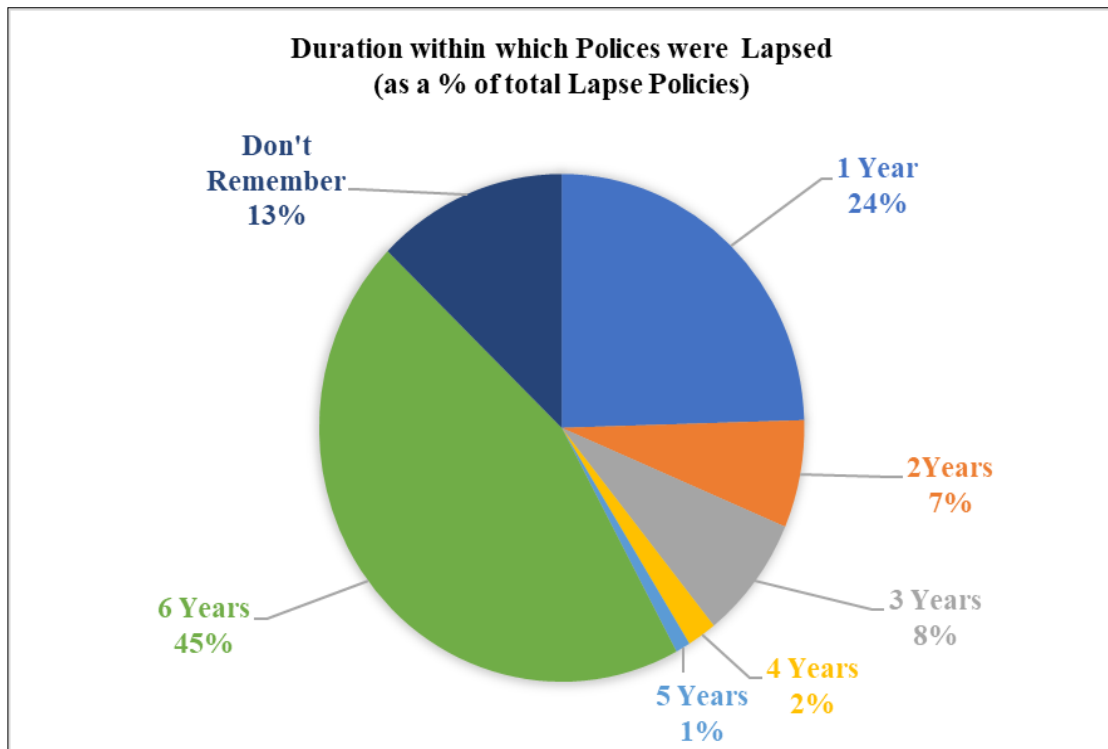
Figure 5.1 Duration of Policy Lapse

5.5.2   Reasons given for Policy Lapsation:

Table I-1 (in Appendix I) shows the reported reasons by the policy holders for their life insurance policy lapse. Figure 5.2 gives a pie chart of the reasons in terms of their relative frequencies. About 43% of the respondents whose policies had lapsed indicated that their policy lapsed because they find that the original reason for taking life insurance was not relevant any more. Another 15% reported that the insurance policy did not meet their investment needs or they felt that they had made a mistake when buying the policy. Thus about 15% of insurance lapse could be possibly attributed to mis-selling. About 21% reported that they forgot to pay the premium while another 20% said that they could not afford the premium.
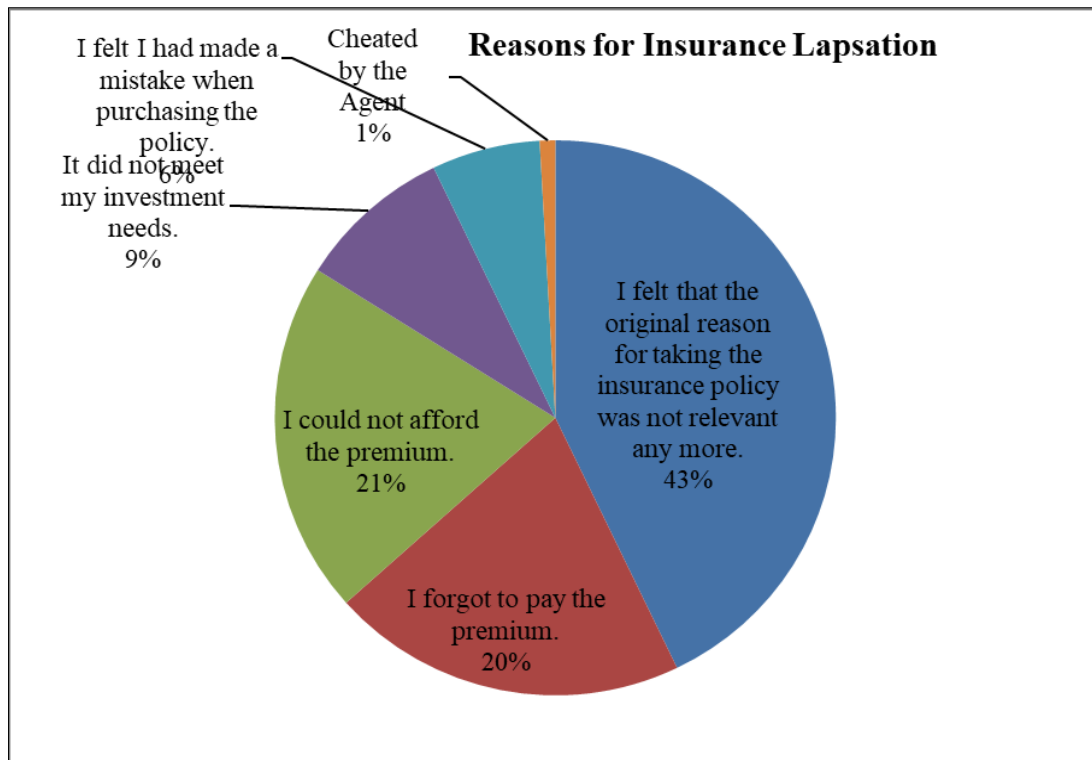
Figure 5.2 Reason for Insurance Lapsation

5.5.3 Demographic Determinants of Policy Lapsation

We built a logistic regression to understand the demographic and socio-economic variables that may affect lapsation of policies. The results are given in Table 5.3.

The main variable that had the highest predictive power was the income category. The reference category had a monthly income less than Rs. 10,000. All individuals in higher income categories had a lower probability of having a lapsed policy compared to this group. This income effect was highly statistically significant and also had a large effect size. Next, we find that individuals who were unemployed or looking for work were more likely to lapse their policies. Education and family status had a smaller but statistically significant effect on lapse probability.

Table 5.3 Demographic and Socioeconomic Determinants of Lapse -Logistic Regression

	Estimate	p value	
(Intercept)	1.60568	0.340856	
AGE_Group 18-24	-0.32864	0.833424	
AGE_Group 25-34	-0.78794	0.61503	
AGE_Group 35-44	-0.70661	0.660379	
AGE_Group 45-55	-1.86737	0.257992	
AGE_Group above 55	-0.04059	0.981459	
Female	0.007484	0.984984	
Married without children	-0.52853	0.389146	
Family with dependent children	-0.40083	0.396262	
Family with independent children	-1.66794	0.082788	.
10th/ 12th	-0.56241	0.436238	
Bachelor's degree	-1.18786	0.081243	.
Professional/Master's degree	-0.4882	0.48491	
Doctorate degree	-0.66467	0.42071	
Looking for work	2.327255	0.005919	**
Homemaker	0.787907	0.383218	
Salaried	0.875521	0.148299	
Self-employed	0.836902	0.228238	
Retired	0.095294	0.940239	
Income 10000-25000	-1.32252	0.005447	**
Income 25001-50000	-2.00328	0.000189	***
Income 50001-100000	-1.61651	0.005579	**
Income >100000	-1.39693	0.016069	*
Would rather not say	-0.96626	0.201169	
AIC	355.66		

5.5.4 Purchase Motives and Policy Lapsation

We build logistic regression models to understand the effect of purchase motivations as well as the kind of policies purchased on policy lapsation probability. The results have been given in Table 5.4 below.

Table 5.4 Effect of Purchase Motives on Lapse of Insurance – Logistic Regression Models

	Estimates	P value	
(Intercept)	-1.45977	0.04317	*
R1 - To save for future needs like children's education & retirement.	-0.00827	0.95187	
R2 - To save some amount regularly so that I don't spent it all	0.058477	0.66081	
R3 - It helps to secure the future of my family in case of death.	0.083282	0.55672	
R4 - To save income tax	-0.28377	0.00561	**
R5 - The life insurance agents convinced me that I should take a policy.	0.28771	0.01241	*
R6 - Life insurance purchase was needed in order to get some loans/services from the bank.	0.041327	0.74536	
R7 - Knowing the life insurance agent socially, I felt a social obligation to invest in an insurance policy.	-0.09738	0.42245	
Children's Plan	0.243753	0.68333	
Retirement Policy	1.014584	0.23602	
ULIP	0.548246	0.44237	
Unknown	0.976532	0.01209	*
Multiple Policies	0.590258	0.14967	
AIC:	382.73		

The most statistically significant and large effect on lapsation of policy was respondent not knowing the type of insurance policy they had purchased. These respondents were far more likely to lapse their policies compare to those that owned a term policy. Interestingly, policies that have been purchased due to the influence of insurance sales agent have higher probability of being lapse. Other type of life insurance policies does not have a significant effect on policy lapse. Results show that, individuals buying life insurance for tax planning are less likely to

lapse their policies. None of the other reasons such as investment reasons etc. were statistically significant in explaining the lapse probabilities.

5.6   Discussion

In this study we were primarily interested in understanding the drivers of lapsation of insurance policies in the Indian context. Primary data was collected from 289 respondents which included data about the reasons for why the policy had lapsed. We found that the most frequently cited reason for policy lapsation was that the original reason for taking the insurance was not relevant any more. This could be due to the fact that the bequest motive had ceased to be important (children have grown up, or beneficiaries of the insurance policy have died etc.) or that the policy had been mis-sold. Two other reasons viz. "it did not meet my investment needs" and "I felt I had made a mistake purchasing the insurance" also possibly point to mis-selling. The other two reasons were related to either the premium being unaffordable (emergency fund hypothesis) or forgetting to pay the premium (cognitive ability). However, we find that the evidence points to the possibility of mis-selling.

Amongst the demographic factors that affect lapsation, we find that poorer individuals or those who were unemployed were more likely to lapse their policies. This is further supported by our analysis in Chapter 2 where we looked at demographic determinants of discontinuation of insurance policies. When we look at the kind of policies that were more likely to lapse, we find that individuals who did not know the kind of policy they owned were more likely to lapse their policies. This possibly points to the fact that these individuals possibly did not have much information about the kind of policies they were buying. They possibly just accepted their agents' advice and the agent may have filled out the required forms. Thus, they are not engaged customers and they may have felt later on that they did not need the insurance in the first place. This points to possible mis-selling of insurance.

Looking at the reasons for insurance purchase that affect lapsation probability we find that insurance policies bought for tax savings purpose were less likely to lapse. As we had expected

life insurance policies that had been bought because the sales agent convinced the customer were more likely to lapse. This again points to the possibility of lapsation as a result of mis-selling. Contrary to our expectations we did not find other purchase motivation to have any effect on policy lapse, but we find that respondents that did not have information regarding their policy type are more likely to lapse their policy. Thus, our results provide support to the original hypothesis that the lapsation of insurance in India is due to large scale mis-selling and lack of awareness and information about insurance products. We conclude that consumer awareness programmes may help in improving life insurance purchase decisions. There is also a need for improving the monitoring mechanism of life insurance agents in order to minimize policy lapse.

Limitation of the study: Our results suggest that social influence, lack of financial awareness and lack of product understanding are the major reasons for life insurance lapses in India. In this study we could not include specific variables related to product knowledge and financial understanding. This can be studies in future research to get a deeper understanding of lapse behaviour in Indian life insurance market.

Chapter 6. Conclusion

In this thesis we have studied several aspects of life insurance demand in India. We were interested primarily in understanding the consumer behaviour associated with life insurance purchase decisions in the Indian context. We studied how individuals made a decision about purchasing insurance, how they made choices about the kind of insurance policy they choose and also the reasons behind why some of the insurance owners let their policies lapse.

First, in order to get an understanding of the dynamics of insurance demand in India, we were interested in seeing which socioeconomic and demographic factors affect changes in life insurance demand within a household. While there have been several studies that have looked at cross-sectional data to analyse household demand for life insurance – i.e. static models, there have been few studies that have looked at changes in insurance consumption. We used a large household level dataset of 34,885 households based on the Indian Human Development Survey which was conducted in two waves in 2004 and 2011.

We were interested in the factors that affect the probability of acquisition of insurance or discontinuation of insurance. For the independent variables, we built a derived variable called SEC class which indicated the socioeconomic class that the household belonged to, based on the level of education of the head of the household and the assets owned. We also built a derived variable that indicated whether a household was poor based on a threshold level of consumption. Separate logistic regression models were built for rural and urban households. Results from these models indicated that variables related to the financial condition of the household (socioeconomic status, the poverty indicator and changes in reported income) were the most important predictors that indicated whether the household would acquire insurance or discontinue coverage. Among the demographic variables we found that family size, the gender and education of the household head affected the probability of acquiring or discontinuing

insurance. In terms of financial inclusion, households that had bank accounts or had taken bank loans were more likely to be insured. Models for insurance expenditure yielded similar insights.

In the second study, we were interested in investigating the factors that affect the attitudinal factors that affect consumer behaviour with regard to purchase of insurance. For this part of the study, we used the Theory of Planned Behaviour which proposes that beliefs, attitudes, subjective norms and perceived behavioural control affect behavioural intention which affects the actual behaviour which in this case is the purchase of insurance. Primary data was collected from a sample of 386 respondents using a questionnaire that had several questions designed to measure these latent constructs in the respondents. Confirmatory factor analysis of the questions yielded three independent constructs. Two of these were the attitude and perceived behavioural constructs. Three questions related to beliefs about insurance and three questions related to subjective norms loaded on the same factor. This indicated that the beliefs about insurance are inextricably linked with the subjective norms. A structural equation model indicated that beliefs and subjective norms had a direct effect on attitudes and attitudes in turn affected behaviour. Perceived behavioural control also affected the behaviour but indirectly through the attitudes.

In the third part of the study, we addressed the research question of how individuals made a choice between different kinds of policies, and how these choices were affected by different factors. We found that about 23% of the respondents in the sample had term policies, about 25% had cash value (or endowment) policies and another 22% had multiple policies. Interestingly we found that about 30% of the respondents did not know what kind of policy they owned. This was a somewhat surprising finding, but it was indicative of the lack of financial knowledge and awareness among many consumers about their investment / insurance decisions. We looked at the demographic factors that affected choice of policies. Older people above 55 years had a higher probability of owning term policies. Younger people were less likely while married individuals without children were more likely to own endowment policies. Finally, males and high-income individuals were more likely to own multiple policies.

We also analysed the reasons for purchasing insurance and found two independent motives viz. an investment motive and a social influence motive. We built logistic regression models to understand how different purchase motives affected choice of policies. Individuals who bought term policies had a tax saving motive and did not have a social influence motive. Individuals who bought endowment policies had a bequest motive and did not have a specific goal in mind such as children's education or marriage. Individuals who bought multiple policies had specific goals in mind. They also wanted to save tax. In terms of social influence, bank relationships had a positive influence on purchase of multiple policies. Knowing the insurance agent socially had a positive effect but selling tactics by the agent had a negative effect on multiple policy purchase. This indicates that multiple policies do serve some needs of the individual – such as keeping their goal specific investments separate from each other (mental accounting); and also helps them in saving taxes. However, there is also some social coercion from banks or insurance agents which may result in individuals purchasing policies that they do not need.

Finally, we studied lapsation of policies that were reported by the respondents in the survey. More than a third of the respondents indicated that their policy had lapsed at some point. The most frequently cited reason for lapsation was that the reason for taking the insurance was not relevant any more. This could mean that the bequest motive was not relevant (children had grown up, or the beneficiary had died etc.). It could also mean an evolution of needs as the insured person grows older. It could also mean that there was a liquidity shock in the family that needed diversion of resources. About 15% of the population felt that they had made a mistake when buying the policy or it did not meet their investment needs. 20% of the respondents said that they had forgotten to pay the premium while another 21% said that they could not afford to pay the premium. We built logistic models to see whether the initial motives for purchase of insurance had any effect on the probability of lapsation. We find that individuals who did not know the kind of policies they had bought were more likely to let their policies lapse. Tax saving motives was negatively associated with lapsation probability and influence of the agent was positively associated with the probability of lapsation. The fact that

lapsation probability was high for individuals who did not know the kind of policies they had indicates a lack of awareness (either due to lack of knowledge or lack of interest) leading to them possibly buying insurance coverage that they did not need or want. The lapsation of policies purchased because their agent advised them to do so indicates a possibility that mis-selling was the root cause behind lapsation.

This thesis makes several original contributions to the extant literature. These are listed below:

i. We model household behaviour in insurance demand in a dynamic framework. That is, it looks at changes in insured status over time.

ii. We find that financial condition has the largest effect on insured status among both rural and urban households, with wealthier households being more likely to own insurance. In addition to reported income, we use socio-economic status and poverty indicators as a measure of financial condition.

iii. Financial inclusion also has a positive effect on a household acquiring insurance.

iv. Using the theory of planned behaviour, we find that beliefs about insurance and subjective norms are inextricably linked with each other.

v. Our results show that beliefs and subjective norms affect attitudes towards insurance and attitudes affect insurance purchase behaviour.

vi. About a third of the respondents did not know the kind of insurance they owned pointing to large scale lack of financial knowledge and awareness.

vii. We find that term policies are chosen for tax savings purposes, endowment policies are chosen for bequest purposes and multiple policies are bought for specific savings goals or because of social influence.

viii. The primary stated reason for lapsation was that the original reason for taking the policy had ceased to be relevant.

ix. Some other stated reasons of lapsation were inability to pay the premium or forgetting to pay the premium.

x. Finally, we find that lapsation probability was high for those who did not know the kind of policy they owned, or those who had bought policy because they had been convinced by the insurance agent. This result points to the possibility of mis-selling of insurance.

Limitations and Scope for Future Research:

In our first study we utilized a large dataset across Indian households, it was limited by the variables which were already included in the Indian Household Development Survey. We missed some important variable related to financial behavior such as financial literacy and financial inclusion. This can be addressed in future research to get a deeper understanding of the microeconomic predictors of life insurance behavior among Indians.

For the behavioural studies we used data from a sample of 386 respondents from the northern part of India. Even though the spread of the respondents was high, the sampling method was convenience sampling – thus our results cannot be generalized to the entire population.

Because of lack of data, we could not build a structural equation model for the policy choice or policy lapsation issues – the models we attempted did have an acceptable fit. With a larger sample, such models may be built and moderating effects of different socioeconomic and psychographic factors may be tested. Especially, financial literacy and product knowledge are the primary reasons for poor insurance behaviour and higher lapse rates in India. In this Thesis We could not study these aspects in detail these can be studies in future research to get a deeper understanding of mis-selling and lapse behaviour in Indian life insurance market.

In this study, we could not see the effect of recent changes in the life insurance sector in India. These could also be studied in future research. Finally, the results of this study are relevant primarily to the Indian insurance industry.

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Schoemaker, P. J., & Kunreuther, H. C. (1979). An experimental study of insurance decisions. *Journal of Risk and Insurance*, 603-618.

Schott, Francis H. (1971) Disintermediation through policy loans at life insurance companies. *The Journal of Finance* 26, no. 3, 719-729.

Sen, Subir. (2008) An analysis of life insurance demand determinants for selected Asian Economies and India. Madras School of Economics.

Shavell, Steven. (1979) On moral hazard and insurance. In Foundations of Insurance Economics, pp. 280-301. Springer, Dordrecht.

Simon, H. A. (1982). Models of bounded rationality: Empirically grounded economic reason (Vol. 3). MIT press.

Sinha, D., & Tripathi, R. C. (1994). Individualism in a collectivist culture: A case of coexistence of opposites.

Sinha, T. (2007). An analysis of the evolution of insurance in India. In Handbook of International Insurance (pp. 641-678). Springer, Boston, MA.

Slovic, P., Fischhoff, B., Lichtenstein, S., Corrigan, B., & Combs, B. (1977). Preference for insuring against probable small losses: Insurance implications. *Journal of Risk and Insurance*, 237-258.

Sommer, M. (2007). Savings motives and the effectiveness of tax incentives-an analysis based on the demand for life insurance in Germany. MEA discussion papers, 125.

Subashini, S., and R. Velmurugan (2016). A study on lapsation of insurers in life insurance policies in Coimbatore." *International Journal of Management Research and Reviews* 6(5), 560.

Talwar, R., & Ali, S. W. (2016). Ethical Issues in Insurance Marketing in India: The Policy Holders' View. *SAMVAD*, 11, 1-12.

Tanaka, J.S. (1987). How big is big enough? Sample size and goodness of fit in structural equation models with latent variables. *Child Development*, 58, 134-146.

Thaler, R. H., & Shefrin, H. M. (1981). An economic theory of self-control. *Journal of Political Economy*, 89(2), 392-406.

Townsend, R. M. (1994). Risk and insurance in village India. *Econometrica: Journal of the Econometric Society*, 539-591.

Ulbinaite, A., Kucinskiene, M., & Le Moullec, Y. (2013). Determinants of insurance purchase decision making in Lithuania. *Inzinerine Ekonomika*, 24(2), 144-159.

Vijay, L., & Tamilselvan, S. (2011). Comparing Traditional Life Insurance Products in the Indian Market: A Consumer Perspective. *Bonfring International Journal of Industrial Engineering and Management Science*, 1, 1.

Wakker, P., Thaler, R., &Tversky, A. (1997). Probabilistic insurance. *Journal of Risk and Uncertainty*, 15(1), 7-28.

Walliser, J., & Winter, J. (1998). Tax incentives, bequest motives and the demand for life insurance: Evidence from Germany.

Yaari, M. E. (1965). Uncertain lifetime, life insurance, and the theory of the consumer. *The Review of Economic Studies*, 32(2), 137-150.

Zhan, Feng, (2013) Individualism, Synchronized Stock Price Movements, and Stock Market Volatility. Available at SSRN: https://ssrn.com/abstract=2220313 or http://dx.doi.org/10.2139/ssrn.2220313

Zietz, E. N. (2003). An examination of the demand for life insurance. *Risk Management and Insurance Review*, 6(2), 159-191.

Zimmer, A., Schade, C., & Gründl, H. (2009). Is default risk acceptable when purchasing insurance? Experimental evidence for different probability representations, reasons for default, and framings. *Journal of Economic Psychology*, 30(1), 11-2

Appendix A(I)- Classical Theories on Life Insurance Demand

Here we provide some notable classical economics studies related to life insurance demand. These studies consider life insurance demand as a lifetime

allocation process within expected utility framework. Consumer is assumed to be risk averse and expected to maximize his life time utility.

Paper	Methodology/ Data	Keywords	Findings
Yaari, M. E. (1965). **Uncertain lifetime, life insurance, and the theory of the consumer**. *The Review of Economic Studies*, 32(2), 137-150.	Theoretical Paper; Lifetime utility Model	savings; bequest; insurance	Assuming consumers are rational, he defines the Fischer Utility Function which is a discounted utility of consumption at different points of time in the life of the consumer. Author also defines a Savings function which is a function of the total earnings, total consumption invested and interest rate. The Fischer utility function assumes that there are no bequests. The Marshallian utility function assumes that there are bequests and that utility is a weighted average of consumption and bequests
Mossin, Jan. "**Aspects of rational insurance purchasing**." *Journal of political economy* 76, no. 4, Part 1 (1968): 553-568.	Theoretical Paper; Expected Utility Theory	utility; risk aversion	Analyzed the wealth effect on the propensity to take insurance coverage. Individual having decreasing risk aversion will take more risk with increase in wealth.
Hakansson, N. H. (1969). **Optimal investment and consumption strategies under risk, an uncertain lifetime, and insurance**. *International Economic Review*, 10(3), 443-466.	Theoretical Paper; Expected Utility theory	insurance; risk aversion; premium	It is shown that when the premium is fair, an individual can increase his expected utility by selling insurance. An individual may be able to make himself better off both by the purchase of insurance on his own life and the sale of insurance on the lives of others.
Fischer, S. (1973). **A life cycle model of life insurance purchases**. *International Economic Review*, 132-152.	Theoretical Paper; Lifetime utility, discrete-time Model	bequest, life insurance	The author assumes that life spans are uncertain and develop a discrete time model of the utility function. He assumes that a person derives utility from consumption when they are alive and utility from bequests when they die. The total expected utility is a probability weighted average of these two different utility functions where the probability of being alive and the probability of being dead are the respective weights.

Rothschild, Michael, and Joseph Stiglitz. "**Equilibrium in competitive insurance markets: An essay on the economics of imperfect information**." *In Uncertainty in economics*, pp. 257-280. 1978.	Theoretical Paper; Expected Utility Theory	Information asymmetry; insurer; insured	In the presence of information asymmetry insurers cannot distinguish between low risk and high-risk customers so a competitive market may have no equilibrium.
Karni, E., & Zilcha, I. (1986). **Risk aversion in the theory of life insurance: the Fisherian model**. *Journal of Risk and Insurance*, 606-620.	Theoretical Paper; Expected Utility Theory, Fisherian Model	Fisherian; risk aversion	The authors study the role of life insurance in fisherian model (i.e. without a bequest motive) where its main role is to improve the opportunities for borrowing. They define the measure of risk aversion and study the implication of differences in degree of risk aversion for the optimal choice of life insurance and lifetime consumption
Babbel, David F., and EisakuOhtsuka. "**Aspects of optimal multiperiod life insurance**." *Journal of Risk and Insurance* (1989): 460-481.	Theoretical Paper; Expected Utility Theory (Multiperiod Model)	Bequest; Consumption	Authors show that whole life insurance, term insurance, and savings are shown likely to coexist in an optimal consumption-investment plan.
Bernheim, B. D. (1991). **How strong are bequest motives? Evidence based on estimates of the demand for life insurance and annuities**. *Journal of political Economy*, 99(5), 899-927.	Empirical Study; Expected Utility Theory; Probit and Tobit model; Longitudinal Retirement History Survey (LRHS) Data	Bequest	Empirical evidences are provided in support of the view that a significant fraction of total saving is motivated by the desire to leave bequests. Results indicate that a household would prefer to hold a fraction of its wealth in bequeathable forms, even if insurance markets were perfect.

Appendix A(II)- Departure from Classical Models of Life Insurance Demand

Many studies Noticed that consumer do not always act as a rational agent and observed anomalies in their insurance purchase behaviors. Here we provide a

literature that highlight departure from the classical economics models of life insurance demand.

Paper	Methodology/ Data	Keywords	Findings
Wallach, Michael A., and Nathan Kogan. "**Aspects of judgment and decision making: Interrelationships and changes with age**." *Systems Research and Behavioral Science* 6, no. 1 (1961): 23-36.	Experimental Study; Comparative analysis; Experimental survey The U.S.; N=511	Risk, behavior, risk aversion	In a risky scenario an older person generally requires a larger probability of success than a younger person. Age has a significant impact on risk taking behavior.
Greene, Mark R. "**Attitudes toward risk and a theory of insurance consumption**." *The Journal of Insurance* 30, no. 2 (1963): 165-182.	Experimental Study; Descriptive analysis; Correlation analysis; Questionnaire Survey; The U.S; N=70 undergraduate students	Risk attitude; Insurance demand	Individuals have a basic set of attitudes toward risk and these attitudes affect their behavior toward different types of risky economic alternatives. The author did not find a relationship between biographical histories and risk-taking attitudes insurance behavior.
Greene, Mark R. "" **Insurance Mindedness". Implications for Insurance Theory**." *The Journal of Risk and Insurance* 31, no. 1 (1964): 27-38.	Experimental; Descriptive analysis; Correlation analysis; Questionnaire Survey; The U.S; N=142 undergraduate students	Risk attitude; Insurance demand	Income seems to vary independently with basic attitudes towards insurance. Financially independent do not buy large amounts of life insurance.
Neter, John, and C. Arthur Williams Jr. "**Acceptability of three normative methods in insurance decision making**." *Journal of Risk and Insurance* (1971): 385-408.	Empirical Study; Expected Utility Model, comparison method and worry Method; Experiment (Questionnaire); Survey data, The U.S.; N=36	Normative; worry; comparative; personality; demographic	Respondents ranked comparison method first, worry method second, and expected utility method third in terms of acceptability in insurance decisions. Personality and demographic characteristics did not have clear association with the different ratings methods. Utility method led zero insurance while the other two methods led to full insurance with or without a deductible.

Slovic, P., Fischhoff, B., Lichtenstein, S., Corrigan, B., & Combs, B. (1977). **Preference for insuring against probable small losses: Insurance implications**. *Journal of Risk and insurance*, 237-258.	Empirical Study; Expected Utility Theory, Threshold Model; Laboratory Experiment; Interview Data, The U.S.; N=700	Utility; risk aversion	People buy more insurance for high probability- small loss event than for low-probability, high-loss event. People refuse to protect themselves against losses where probability is below some threshold.
Zelizer, Viviana A. **"Human values and the market: The case of life insurance and death in 19th-century America**." *American journal of sociology* 84, no. 3 (1978): 591-610.	Qualitative Analysis; Historical data Analysis;	Life insurance; culture; history	Life insurance was initially rejected as people view it as a profanation which transformed the sacred event of death into a commodity. In late 19th century, the economic valuation of death became more acceptable, legitimating the life insurance enterprise.
Schoemaker, P. J., &Kunreuther, H. C. (1979). **An experimental study of insurance decisions**. *Journal of Risk and Insurance,* 603-618.	Experimental Study; Expected Utility Theory, Prospect theory; Experiment; Survey data, N=240 undergraduate students and 630 insurance Clients	prospect theory; utility theory; insurance;	The results indicate more support to prospect theory than utility theory. Insurance decisions appear more complex than either model suggests. The findings support people's limited abilities to process information.
Auerbach, A. J., &Kotlikoff, L. J. (1989). **How rational is the purchase of life insurance**? *(No. w3063). National Bureau of Economic Research.*	Empirical Study; Expected utility theory; Probit Model; Consumer Finance survey Data of 1980; 1982 and 1984; N=1243 households; The U.S.	Life insurance; Households; spouse	Findings indicate that a significant number of American wives are highly under-insured. Under insurance is more significant among households with modest means, this was consistent regardless of whether fair annuities are available or not.
Johnson, Eric J., John Hershey, Jacqueline Meszaros, and Howard Kunreuther. "**Framing, probability distortions, and insurance decisions**." *Journal of risk and uncertainty* 7, no. 1 (1993): 35-51.	Empirical Study; descriptive analysis; Survey data, The U.S.; N=136 University Employees	insurance decisions; biases; probability dist.	Subjects exhibit distortions in their perception of risk and framing effects in evaluating premiums and benefits. Illustrations from insurance markets indicate the same effects in actual insurance decisions
Wakker, P., Thaler, R., &Tversky, A. (1997). **Probabilistic insurance**. *Journal of Risk and*	Empirical Study; Prospect theory; Survey	probabilistic insurance;	Findings suggest that people dislike probabilistic insurance and demand significant reduction in the premium to compensate for

Uncertainty, 15(1), 7-28.	Data; The U.S.; N=86	decision weights; prospect theory	default risk. While these preferences do not reconcile with expected utility theory. Probabilistic insurance purchase behavior is predicted by the weighting function of prospect theory.
Hsee, Christopher K., and Howard C. Kunreuther. "**The affection effect in insurance decisions**." *Journal of Risk and Uncertainty* 20, no. 2 (2000): 141-159.	Empirical Study; descriptive analysis; Survey Data; The U.S.; N=618	Affect; Insurance; consolation	People purchase more insurance for an object at stake, the more affection they have for the object. amount of compensation constant. People are also more willing to go through the trouble of claiming a fixed amount of compensation, the more affection they have for the object. These effects are not predicted by standard decision theories.
Kunreuther, H., & Pauly, M. (2004). **Neglecting disaster: Why don't people insure against large losses?** J*ournal of Risk and Uncertainty*, 28(1), 5-21.	Theoretical Paper; Expected utility theory;	insurance; decision-making; Uncertainty; information	This paper provides a theoretical explanation for the common observation that people often fail to purchase insurance against low-probability high-loss events even when it is offered at favorable premiums. Individuals maximize expected utility but face an explicit or implicit cost to discovering the true probability of rare events.
Kunreuther, H., & Pauly, M. (2006). **Insurance decision-making and market behavior**. *Foundations and Trends® in Microeconomics*, 1(2), 63-127.	Theoretical Paper; Theory of Loss aversion, Threshold model, Expected utility;	insurance; decision-making; Market Behavior; Anomalies	Paper represents a constructive theory of insurance decision-making to explain behavior that does not conform to standard economic models of choice and decision-making.
Zimmer, A., Schade, C., & Gründl, H. (2009). **Is default risk acceptable when purchasing insurance? Experimental evidence for different probability representations, reasons for default, and framings**. *Journal of Economic Psychology*, 30(1), 11-23.	Experimental Study; Factor analysis; ANOVA; Logistic regression; Survey data, Germany; N=1100	Insurance default risk Verbal probabilities Concern Framing	Authors find that insurance with default risk is extremely unattractive. The major driver of willingness to pay is level of security concern. Insurance decisions are sensitive to the default probability.
Gottlieb, D. (2012). **Prospect Theory, Life Insurance, and Annuities**. *The Wharton School Research Paper*	Theoretical Paper; Prospect theory;	Prospect theory; life insurance	Author provide a prospect theory-based model to explain insurance anomalies such as insufficient life insurance among the working age; excessive life insurance among the elderly and

		policies; behavioral economics	the simultaneous holding of life insurance and annuities. The predictions of the model differ from expected and non-expected utility models. Individuals may refuse insurance coverage even when premiums are actuarially fair
Buzatu, Cristian. "**The Influence of Behavioral Factors on Insurance Decision–A Romanian Approach**." *Procedia Economics and Finance* 6 (2013): 31-40.	Theoretical Paper	Life insurance; social norms; emotions; culture	Author discusses the effect of behavioral factors such as emotions, personal biases, social norms and financial culture.

Appendix A(III)- Socioeconomic and Psychographic Predictors of Life Insurance Demand

One of the basic assumption of classical economics models of insurance demand is that consumers are risk averse. But it is very difficult to measure one's

degree of risk aversion as it depends upon several factors such as wealth, education, age etc. Researchers have used several demographic and socio-economic

variables as a proxy for risk aversion. Here we provide some notable studies that have used socioeconomic and demographic factors to explain the demand for

life insurance.

Paper	Methodology/ Data	Keywords	Findings
Hammond, J. D., David B. Houston, and Eugene R. Melander. "**Determinants of household life insurance premium expenditures: An empirical investigation**." *Journal of Risk and Insurance* (1967): 397-408.	Empirical Study Study;1952 and 1961 Survey data conducted by Research Center of the University of Michigan	Life insurance, household, socio economic	Income, net worth, stage in the life cycle of the household, education and occupation of the household head were found to be significantly related to premium expenditures.
Berekson, Leonard L. "**Birth order, anxiety, affiliation and the purchase of life insurance**." *Journal of Risk and Insurance* (1972): 93-108.	Empirical Study; multiple regression analysis; Questionnaire Survey; The U.S.; N=254	Birth order; Anxiety; Life insurance; Regression	Study examines the role of birth order in relating anxiety to insurance purchasing decision. life insurance purchasing behavior of married and high-income individuals does not show evidence of a birth order effect.
Anderson, Dan R., and John R. Nevin. "**Determinants of young marrieds' life insurance purchasing behavior: An empirical investigation**." *Journal of Risk and Insurance* (1975): 375-387.	Empirical Study; survey data, The U.S.; N=181 household	Life insurance, decisions, married, households	Husband's Education, Income, Net worth and insurance before marriage affects life insurance purchase.
Ferber, Robert, and Lucy Chao Lee. "**Acquisition and accumulation of life insurance in early married life**." *Journal of Risk and Insurance* (1980): 713-734.	Empirical Study; Multiple regression analysis; Survey data; N= 105 households	life insurance; young couples; socioeconomic; attitudinal;	Life insurance purchases of young couples are affected by financial status, assets and debts. Existence of systematic spending and saving practices, participation of the wife in the labor market and attitudes toward saving also affect life insurance purchase behavior.

Burnett, John J., and Bruce A. Palmer. "**Reliance on life insurance agents: a demographic and psychographic analysis of consumers**." *Journal of Risk and Insurance* (1983): 510-520.	Empirical Study; discriminant analysis; Questionnaire Survey; N=181	Life insurance; demographic; Psychographic; Multiple discriminant analysis	The results suggest that life insurance consumers who have an agent on whom they rely tend to have larger amounts of life insurance. They consider insurance to be very important, are younger, tend to be female, are concerned with their health, are not opinion leaders, and are single
Burnett, John J., and Bruce A. Palmer. "**Examining life insurance ownership through demographic and psychographic characteristics**." *Journal of risk and insurance* (1984): 453-467.	Empirical Study; Multiple classification analysis; Questionnaire Survey; N=181	Life insurance; demographic; Psychographic; Multiple classification analysis	Results suggest that belief in the traditional work ethic, fatalism, socialization preference, religion salience, and assertiveness were the most important predictor variables of life insurance demand. Education, number of children, and income were the best demographic predictors.
Truett, Dale B., and Lila J. Truett. "**The demand for life insurance in Mexico and the United States: A comparative study**." *Journal of Risk and Insurance* (1990): 321-328.	Empirical Study; Regression Model; Time series Data from U.S. and Mexico	Life insurance, socioeconomic, comparative study	Age, education, and level of income affect the demand for life insurance.
Showers, Vince E., and Joyce A. Shotick. "**The effects of household characteristics on demand for insurance: A tobit analysis**." *Journal of Risk and Insurance* (1994): 492-502.	Empirical Study; Tobit; Consumer Expenditure survey Data; N=1723 households; The U.S.	Life insurance, Household, demographic variables	Age, income, family size and number of earners have a significant impact on demand for insurance.
Outreville, J. Francois. "**Life insurance markets in developing countries**." *Journal of Risk and Insurance* (1996): 263-278.	Empirical Study; Regression Models; Cross-section of 48 developing countries for 1986	developing countries; financial development	Many developing countries consider financial institutions that are locally incorporated or even state-owned monopolies an essential element of their economic and political independence.
Beck, Thorsten, and Ian Webb. "**Economic, demographic, and institutional determinants of life insurance consumption across countries**." *The World Bank Economic Review* 17, no. 1 (2003): 51-88.	Empirical Study; Lifetime utility; Regression Models; Panel data; 68 countries	life insurance; determinants; cross country; panel data	Inflation, income per capita, and banking sector development, religion are the most significant predictors of the life insurance ownership. Education, life expectancy, the young dependency ratio and the size of the social security system are not significantly associated with life insurance consumption.
Pauly, M. V., Withers, K. H.,	Empirical Study;	Term Life	Price premium elasticity of demand was negative. Elasticity of

Subramanian-Viswana, K., Lemaire, J., & Hershey, J. C. (2003). **Price elasticity of demand for term life insurance and adverse selection** (No. w9925). *National Bureau of Economic Research*.	Regression; LIRMA data	Insurance; demand; Price; adverse selection	coverage with respect to mortality risk was positive. Demand is less sensitive to risks than premium
Zietz, E. N. (2003). **An examination of the demand for life insurance**. *Risk Management and Insurance Review*, 6(2), 159-191.	Review Paper	Life Insurance; demand; demographic; economic	Age, income, education, marital status, family size and occupation were among the most significant determinants of life insurance demand. Author also pointed out that some of the studies found conflicting and contradictory results for certain determinants of life insurance demand such as age and family size.
Lee, Chien-Chiang, and Yi-Bin Chiu. "**The impact of real income on insurance premiums: Evidence from panel data**." *International Review of Economics & Finance* 21, no. 1 (2012): 246-260.	Panel Data of 36 Countries (1979-2007)	Insurance; Premium;	There is linear relationship between insurance premium and real income per capita. Life insurance is a necessary good while non-life insurance a luxury good.
Okura, Mahito, and Norihiro Kasuga. "**Financial Instability and Life Insurance Demand**." *Asia-Pacific Journal of Risk and Insurance* 2, no. 1 (2007).	Empirical Study; Regression; Simultaneous Estimation; Survey Data; Japan; N=2004	Life insurance; Financial knowledge; socioeconomic	Income, children, pension, bankruptcy experience, assets and financial knowledge have a positive impact on insurance demand. Government employees don't buy much insurance. Financial instability does not affect life insurance demand. Household who have experienced bankruptcy prefer Public life insurance.
Zhang, Xumei, Yingxiu Zhang, HanguangQiu, and Bin Dan. "**An Empirical Study of The Key Factors Affecting Consumers' Purchase Decision on Life Insurance.**" *Service Systems and Service Management*, 2007 International Conference on, pp. 1-5. IEEE, 2007.	Empirical Study; Structural equation modeling; survey data; N=426; China	Life insurance; Purchase behavior; Structure Equation Model	Extent of worrying, economical condition, cognition about life insurance have significant positive effects on the intention of purchasing life insurance; economical condition has significant positive effect on life insurance purchase.
Zhu, Yanyun. "**One-Period Model of**	Theoretical Paper; discreate	Life insurance;	Life insurance purchases are affected only by individuals' future

Individual Consumption, Life Insurance, and Investment Decisions." *Journal of Risk and Insurance* 74, no. 3 (2007): 613-636.	time model; exponential utility function; power utility function;	savings; bequest intensity; risk attitude; survival probability	income, bequest intensity, risk attitude, survival probability, and the insurance risk premium.
Chui, A. C., & Kwok, C. C. (2008). **National culture and life insurance consumption**. *Journal of International Business Studies,* 39(1), 88-101.	Empirical Study; Regression Analysis; cross country data for 48 countries	National culture; insurance; insurance consumption; Hofstede	The findings show that individualism has a positive effect on life insurance consumption. Power distance and masculinity/femininity have negative effects.
Hecht, C., & Hanewald, K. (2010). **Sociodemographic, economic, and psychological drivers of the demand for life insurance: Evidence from the German retirement income act** (No. 2010-034). *SFB 649 discussion paper*.	Empirical Study; Multivariate regression; Probit; survey data; Germany; N=4723	Life insurance demand; tax incentives; financial literacy	Study shows that two very different consumer groups buy endowment life insurance before and after the tax reform. Advice from financial professionals increases endowment insurance demand. Households seeking to cover dependents are more likely to buy endowment insurance.
Liebenberg, A. P., Carson, J. M., & Dumm, R. E. (2012). **A dynamic analysis of the demand for life insurance**. *Journal of Risk and Insurance*, 79(3), 619-644.	Empirical Study; Regression; Survey Data; U.S.; N=1479	Life insurance, Demand; Life events	Life events such as marriage, new child and new job are related to initiating a new policy or increasing coverage. Death of spouse, unemployment and separation results in decreasing coverage or dropping life insurance
Park, Sojung Carol, and Jean Lemaire. "**The impact of culture on the demand for non-life insurance**." *ASTIN Bulletin: The Journal of the IAA* 42, no. 2 (2012): 501-527.	Empirical Study; Regression Models; Panel Data; N=82 Countries	Life insurance; Demand; Culture	Non-life insurance consumption is adversely affected in countries where a large fraction of the population has Islamic beliefs. Three of the cultural dimensions developed by Hofstede were highly significant: Power Distance, Individualism, and Uncertainty Avoidance.
Arun, T., Bendig, M., &Arun, S. (2012). **Bequest motives and determinants of micro life insurance in Sri Lanka**.*World Development*, 40(8), 1700-1711.	Empirical Study; Probit model; Tobit model; Survey data; Sri Lanka; N=330 households	financial markets; microinsurance; life insurance	Participation in micro life insurance is positively correlated with the number of children or dependents in the household indicating a possible bequest motive. Financially better off households participate more in micro-life insurance than their poorer counterparts.

Annamalah, S. (2013). **Profiling and Purchasing Decision of Life Insurance Policies among Married Couples in Malaysia**.*World Applied Sciences Journal*, 23(3), 296-304.	Empirical Study; Logit model; Survey data; Malaysia; N=525 households	Profiling; Life insurance; Married couples	Income and education are positively related to life insurance demand while age, number of children, occupation and working spouse were found to be insignificant
Buzatu, Cristian. "**The Influence of Behavioral Factors on Insurance Decision–A Romanian Approach**." *Procedia Economics and Finance* 6 (2013): 31-40.	Theoretical Paper	life insurance; social norms; emotions; culture	Author discusses the effect of behavioral factors such as emotions, personal biases, social norms, financial culture
Ulbinaite, A., Kucinskiene, M., & Le Moullec, Y. (2013). **Determinants of insurance purchase decision making in Lithuania**. *Inzinerine Ekonomika*, 24(2), 144-159.	Empirical Study; Factor analysis and multiple regression analysis; Survey Data; Luthiana; N=336	Life insurance; Demand; Demographic; economic	Demographical and socio economical characteristics of the consumers influence their insurance behavior. Youth and young adults rely on the insurance service provider's competence. Families without children take a wider range of factors into account when making the insurance purchase decision.
Mahdavi, Ghadir, and Mojtaba Abed. "**The Effect of Risk Aversion on Lapsation in Iran Life Insurance Market**." *Iranian Journal of Risk and Insurance* 1.1 (2015).	Empirical Study; Logistic Model; Hand Collected data; Iran; N=1000	Adverse Selection; Lapsation; Risk Aversion	Investigated the effect of risk aversion on policy lapsation. They used age, gender and marital status as risk aversion proxies and find that these significantly affect the lapsation of life insurance policies. They concluded that individuals that have low levels of risk aversion were more likely to lapse their policies.
Hakkak, Mohammad, Hojjat Vahdati, and Afsaneh Sharifinasab. "**Investigate the role of customer attitude in the process of emotional marketing impact on savings and life insurance buy intention (case study: Iran Insurance Agency in Ahvaz City**)." *International Business Management* 10, no. 10 (2016): 1799-1808.	Empirical Study; Structural equation modeling; survey data; N=384; Iran	attitude; emotional marketing; saving; life insurance; intension; Iran	Study found that there is positive relationship between emotional marketing, customer attitude and buying intension

Appendix A(IV)- Theory of reasoned action (TRA) and Theory of Planned Behavior (TPB)

We have used theory of planned behavior to study life insurance purchase behavior in India. Here we provide a description of some studies that have applied

TRA or TPB in life insurance purchase decisions.

Paper	Methodology/ Data	Keywords	Findings
Hastings, William J., and Keith P. Fletcher. "**The relevance of the Fishbein model to insurance buying**." *The Service Industries Journal* 3, no. 3 (1983): 296-307.	Empirical Study; Theory of Reasoned action; descriptive analysis; Survey data; N=57 University Student	Theory of Reasoned action; Attitude; belief; subjective norms	Respondents believed in general that life assurance was a means of accumulating money and providing a lump sum. Respondents showed lack of interest and knowledge about life insurance, even by those having life insurance.
Fletcher, Keith P., and William J. Hastings. "**Consumer choice: a study of insurance buying intention, attitudes and beliefs**." *The Service Industries Journal* 4, no. 2 (1984): 174-188.	Empirical Study; Theory of Reasoned action; Regression Analysis; Survey data; N=57 University Student	Theory of Reasoned action; Attitude; belief; subjective norms	Intention to purchase life assurance is determined by their beliefs concerning the advantages and disadvantages of purchase and by their beliefs about whether relevant referents think they should or should not purchase life assurance.
Kurland, N. B. (1996). **Trust, accountability, and sales agents' dueling loyalties**. *Business Ethics Quarterly*, 289-310.	Empirical Study; TORA, TPB; regression; survey data, The U.S.; N=245 insurance agents	ethical intension; insurance; agent	Study compares the explanatory power of theory of reasoned action, theory of planned behavior, and a modified version of the theory of planned behavior. The results suggest that the modified version of the theory of planned behavior best explains agents' ethical intentions.
Omar, Ogenyi Ejye. "**The retailing of life insurance in Nigeria: an assessment of consumers' attitudes**." *The Journal of Retail Marketing Management*	Empirical Study; Theory of Reasoned action; Regression Analysis; Survey data; Nigeria; N=240	Theory of Reasoned action; Attitude; belief;	Findings show that increased level of consumer consciousness and lack of welfare benefits are encouraging growth in life insurance market.

		subjective norms	
Haron, Hasnah, Ishak Ismail, and Shaikh Hamzah Abdul Razak. "**Factors influencing unethical behavior of insurance agents**." *International Journal of business and social science*2, no. 1 (2011).	Empirical Study; Theory of Planned behavior; Hierarchical Multiple Regression; Factor Analysis; Survey data; N=246 insurance agents; Malaysia	Unethical behavior; Theory of planned behavior; insurance; agents	Study found that attitude partially mediates the relationship between supervisory influence, role ambiguity and sales target on intention to perform unethical behavior. Subjective norm and moral obligation was found to partially mediate the relationship of supervisory influence and role ambiguity on intention to perform unethical behavior
Ab Rahim, Fithriah, and Hanudin Amin. "**Determinants of Islamic insurance acceptance: an empirical analysis**." *International Journal of Business and Society* 12, no. 2 (2011): 37.	Empirical Study; Theory of Reasoned action; Factor analysis; Multiple regression analyses; Survey data; N=176; Malaysia	Attitude; Subjective Norm; AOI; Islamic insurance; Malaysia	The study found that that attitude, subjective norm, and amount of information are influential predictors of Islamic insurance acceptance.
Md Husin, Maizaitulaidawati, and Asmak Ab Rahman. "**What drives consumers to participate into family takaful schemes? A literature review**." *Journal of Islamic Marketing* 4, no. 3 (2013): 264-280.	Theoretical Paper; Theory of Planned behavior; Literature Survey	Takaful; Intention; Attitudes; Subjective norm; Perceived behavioral control Consumer behavior;	Intention toward participating in family takaful scheme are not only affected by attitude, subjective norm and perceived behavioral control but also influence by moderating factors like demographic variables and consumer knowledge,

Nosi, Costanza, Antonella D'Agostino, Margherita Maria Pagliuca, and Carlo Alberto Pratesi. "**Saving for old age: Longevity annuity buying intention of Italian young adults**." *Journal of Behavioral and Experimental Economics* 51 (2014): 85-98.	Empirical Study; Theory of reasoned action; structural equation modeling approach; Survey data; N=7480; Italy	Longevity annuity	Intention to purchase a longevity annuity was determined to be affected by both attitude toward buying and the subjective norm. with a greater influence of social pressure over attitude. Intention to buy longevity annuity policies was significantly moderated by gender, annual household income and education.

Appendix A(V)- Life Insurance Studies in India

Here we provide an overview of the life insurance studies in India. It is to gives an insight of the overall status of the research in the domain of life insurance market in India.

Paper	Methodology/ Data	Keywords	Findings
Townsend, R. M. (1994). **Risk and insurance in village India. Econometrica**: *Journal of the Econometric Society*, 539-591.	Empirical Study; Regression; ICRISAT data; India	Risk; insurance; consumption smoothing; village economies.	Insurance consumption is not much affected by household characteristics in rural India. Landless are less insured as compared to land holding households.
Ranade, Ajit, and Rajeev Ahuja. (1999) **Life insurance in India: Emerging issues**. *Economic and Political Weekly*: 203-212.	Descriptive Analysis; Insurer's Data; India	Life insurance; LIC; Liberalization	Provide an overview of life insurance operations in India post liberalization.
Rao, D. T. (1999). **Life insurance business in India: analysis of performance.***Economic and Political Weekly*, 2174-2181.	Descriptive Analysis; Insurer's Data; India	Life Insurance; LIC	Analyses business growth and income of life insurance business in the country.
Bodla, B. S., & Verma, S. R. (2007). **Life Insurance Policies in Rural Area: Understanding Buyer Behavior**. *ICFAI Journal of Services Marketing*, 5(4).	Empirical Study; Descriptive analysis; Survey data; India; N=200	Life insurance, Buyer's behavior	Maximum Number of Policyholders belongs to age group of 21-30 years and 31-40 years. Most consumers belong to private business category followed by service category and agriculture. Most of the people hold money back plans followed by whole life insurance and Endowment plans. Maximum policyholders are insured with LIC.
Sen, Subir. **An analysis of life insurance demand determinants for selected Asian Economies and India**. *Madras School of Economics*, 2008.	Empirical Study; Panel Data Regression Models; Panel data for 12 selected Asian countries	Life insurance, Macroeconomic factors	Gross domestic savings, Financial Depth and life expectancy are significant variables and have positive impact on life insurance consumption. Urbanization, young dependency ratio, old dependency ratio, adult literacy and inflation have negative impact.

Das, B., Mohanty, S., &Shil, N. C. (2009). **Mutual fund vs. life insurance: Behavioral analysis of retail investors**. *International Journal of business and management*, 3(10), 89.	Empirical Study; Two-way ANOVA; Survey data; N=100; India	Life insurance; investment;	Graduates and post graduates invest more in life insurance and professionals invest more in Mutual Funds. Majority of investors invest with an objective of capital growth followed by tax saving and retirement plan. Male investors are more as compared to female investors.
Anagol, S., Cole, S., & Sarkar, S. (2017). **Understanding the advice of commissions-motivated agents: Evidence from the Indian life insurance market**. *Review of Economics and Statistics*, 99(1), 1-15.	Experimental Study; Regression analysis; Field Experiments; N=711; India	Life insurance; agents, advice	Insurance agents try to maximize their commission and most of the times recommend whole life insurance despite being dominated by term insurance. Sophisticated individuals are more likely to be recommended right products.
Vijay, L., &Tamilselvan, S. (2011). **Comparing Traditional Life Insurance Products in the Indian Market: A Consumer Perspective**. *Bonfring International Journal of Industrial Engineering and Management Science*, 1, 1.	Empirical Study; Descriptive analysis; Life insurer's data; India	Policyholder; Traditional Insurance	In Indian market it is better to buy a term policy and investing the difference in Public Provident Fund
Mall, S. and Sahoo, S., (2015) **Determinants of lapsation of life insurance policies: an empirical investigation for the Indian market.** *International Journal of Financial Services Management*, 8(2), pp.133-147.	Empirical Study; logistic regression; life insurer's Data; India; N= 2967	lapsation; dependency; outstanding premium; outstanding duration; rider; mode of payment; product type; policy duration	life insurance policy lapse is related to policy characteristics such as sum assured, policy type and policy duration. Policyholder's characteristics such as age, occupation and marital status also have a significant effect. Chances of a policy lapsing is higher if the policy holder is young and less educated.
Dash, Ganesh, and Tulika Sood. **"Why Should One Invest in a Life Insurance Product? An Empirical Study."** *Researchers World 4*, no. 1 (2013): 36.	Empirical Study; ANOVA; Survey data; N=215; India	Life insurance; policy holders	Most of the policyholders buy life insurance product for providing financial security to their families. Policy holders ranked the 'financial security' aspect of the life insurance product as 'One' followed by the 'saving scheme' aspect.
Ahmed, A. (2013). **Perception of life**	Empirical Study;	Rural Insurance;	In India life insurance is widely used as a tool for savings and

insurance policies in rural India. *Kuwait Chapter of Arabian Journal of Business and Management Review*, 2(6), 17-24.	Descriptive analysis;	Penetration; Marketing Strategy; Perception; Micro-Insurance	investment. Awareness and understanding regarding life insurance products is low.
Kakar, P., & Shukla, R. (2010). **The determinants of demand for life insurance in an emerging economy-India**.*Margin: The Journal of Applied Economic Research*, 4(1), 49-77.	Empirical Study; Logistic Regression; NCAER Survey Data; N=63016; India	Life insurance; Demand; demographic; Socioeconomic	Life insurance awareness and ownership is highest among households with a regular salary. In urban areas, households who focus on short-term saving needs showed a lower propensity to participate in life insurance.
Halan, M., Sane, R., & Thomas, S. (2014). T**he case of the missing billions: estimating losses to customers due to mis-sold life insurance policies**. *Journal of Economic Policy Reform*, 17(4), 285-302.	Empirical Study; Lapsed policies Value; Persistence of premium payments; Hand collected data from the annual reports; India	Life Insurance; Lapse; Mis selling	Using IRDA data estimated losses to customers on account of mis selling turned out to be Rs1.62 trillion
Padmavathi, V. "**Lapsation of Life Insurance Policies: A Study on the Role of Remuneration Structure**." *ASCI Lecture* 43.2 (2014): 68.	Descriptive Analysis; descriptive analysis; Survey data; N=90 insurance agents; India	Lapsation; agent; incentive	Front-loading and commission structure of insurance agents encourage them to acquire new clients but does not incentivize them to pursue old customers to renew their policies. In the absence of an inherent need for the insurance, this kind of selling practices leads to high lapsation rates.
Subashini, S., and R. Velmurugan. "**A study on lapsation of insurers in life insurance policies in Coimbatore**." *International Journal of Management Research and Reviews* 6.5 (2016): 560.	Empirical Study; Garrett Ranking; Interview Data; N=50; India	Lapsation; life Insurance; India	Mis-selling and high premium charges are the primary reason for policy lapse in India
Deshmukh, Mr Sandeep, and Rajiv Jadhao. "**Customers Perception for Taking Life Insurance: A Critical Analysis of Life Insurance Sector in Nagpur**." *Imperial Journal of*	Empirical Study; Descriptive analysis; survey data; N=200; India	Life Insurance Policies; Reasons to take Life Insurance	Savings, Wide risk coverage and Tax shelter are the most important reasons for taking life insurance.

Interdisciplinary Research 3, no. 6 (2017).			
Pradeepa, S., and A. A. Ananth. "**A Study on Factors Influencing of Women Policyholder's Investment Decision towards Life Insurance Corporation of India Policies in Chennai**." *Singaporean Journal of Business, Economics and Management Studies* 51, no. 122 (2017): 1-7.	Empirical Study; Descriptive analysis; Regression; survey data; N=520; India	Life insurance; policy; working women; decision on investment	Married women invest more in LIC as compared to unmarried women. Financial support, tax saving, saving for retirement and premium amount were the significant factors that affect the life insurance decisions.
Halan, M., & Sane, R. (2017). **Do disclosures matter? The case of life insurance**. *Working Paper*	Experimental Study; Regression analysis; Survey; N=300; India	Life insurance; disclosure	Life insurance accounts for 19% of total household financial assets in India of INR 12,356 billion for 2014-15. Traditional endowment products account for 87% of the total business of INR 3.6 trillion in the life insurance market in India. Product disclosure does not affect much the decision to invest in life insurance products. For disclosures to have any effect, customers need to have a minimal understanding of the product features that are being disclosed

Appendix A(VI)- Life Insurance policy Lapse/ Mis-selling

Literature that have been provided below gives an overview of the Life insurance lapse behavior and highlight the problem of mis-selling in the life insurance market.

Paper	Methodology/ Data	Keywords	Findings
Outreville, J. Francois. "**Whole-life insurance lapse rates and the emergency fund hypothesis.**" *Insurance: Mathematics and Economics* 9, no. 4 (1990): 249-255.	Empirical Study; Regression Models; LIRMA lapse data; The U.S.	Lapse rates; Interest rate hypothesis; Emergency fund hypothesis.	Results support emergency fund hypothesis. Lapse rates are higher during unemployment. Interest rates and government bond rates were found to be insignificant.
Li, R. M., Lindberg, L. D., & Lin, H. S. **Life Insurance for Old Age Security? An Exploration of the Characteristics and Motivations of Insureds in Taiwan**. *Demographic transition, health care and social security*	Empirical Study; Logit Regression; Survey data of Taiwan Provincial institute of Family Planning; N=2989	Life insurance; motivations; old age; security	Study found that about 20% respondent purchased insurance for safely however 40% reported that they purchased insurance as a favor to the salesperson.
Kuo, W., Tsai, C. and Chen, W.K., (2003). **An empirical study on the lapse rate: the cointegration approach**. *Journal of Risk and Insurance*, 70(3), pp.489-508.	Empirical Study; Cointegration analysis; NAIC data; The U.S.	Insurance; Lapse; Emergency Fund Hypothesis; Interest Rate Hypothesis	Unemployment affect lapse rate in short run as well as in long run. Interest rate was found to affect the insurance lapse rate mainly in the long run
Ericson, R. V., & Doyle, A. (2006). **The institutionalization of deceptive sales in life insurance: five sources of moral risk**. *British Journal of Criminology*, 46(6), 993-1010.	Empirical Study; Interview and ethnographic data; The U.S. and Canada; N=224	deceptive; Sales; Institution	Risk assessment is extremely difficult and returns on investment-oriented life insurance products are highly speculative and uncertain. Deceptive sales practices have been institutionalized in life insurance industry.

Fang, H., & Kung, E. (2012). **Why do life insurance policyholders lapse? The roles of income, health and bequest motive shocks** (No. w17899). *National Bureau of Economic Research*.	Empirical Study; Survey Data; The U.S.; N=3567	Life Insurance; Lapse; Bequest	Richer, younger and married individuals are more likely to take insurance. Negative income shocks, divorce and separation are related to policy lapse. For younger individual choice specific shocks affect the policy lapse while for older people lapsations are the result of income, health and bequest motive shocks.
Fier, Stephen G., and Andre P. Liebenberg. "**Life insurance lapse behavior**." *North American Actuarial Journal* 17, no. 2 (2013): 153-167.	Empirical Study; Logistic regression; Survey Data; The U.S.; N=14673 households	Life insurance; Policy Lapse; Emergency fund hypothesis; Policy replacement hypothesis	Consistent with the emergency fund hypothesis lapses are related to large income shocks. Consistent with the policy replacement hypothesis, decision to lapse a life insurance policy is directly related to the purchase of a different life insurance policy. Age is an important moderating factor in the lapse decision. Changes in income appear to more directly affect the decision to lapse for younger households, while they are generally unrelated to the lapse decision for older households.
Eling, M., & Kochanski, M. (2013). **Research on lapse in life insurance: what has been done and what needs to be done?** *The Journal of Risk Finance*, 14(4), 392-413.	Review Paper	Lapse; Surrender; Lapse Modeling; Life Insurance	Authors provide a structured review of 44 papers that have looked at lapse rate modelling and 12 empirical papers. They conclude that while there have been several studies that have looked at overall lapse rates in the insurance industry, there have been few studies that look at individual decision making and looking at the "why" behind the lapse decision especially as it applies to specific individuals.
Russell, David T., Stephen G. Fier, James M. Carson, and Randy E. Dumm. "**An empirical analysis of life insurance policy surrender activity**." *Journal of Insurance Issues* (2013): 35-57.	Empirical Study; Regression; NAIC data; The U.S.	Life insurance; surrender; IRH; PRH	Study finds evidences in support of emergency fund hypothesis and interest rate hypothesis. They also found that lapse is also affected by policy replacement.
Mulholland, Barry, and Michael Finke. "**Does Cognitive Ability Impact Life Insurance Policy Lapsation**?" (2014). *Working Paper*	Empirical Study; Logistic Regression; Survey data; The U.S.; N=37000	life insurance; cognitive ability; lapsation	Individual's cognitive ability affects the policy lapse. Economically well-off individuals are less likely to lapse. Recently retired household has high probability of lapse.

Eling, Martin, and Dieter Kiesenbauer. "**What policy features determine life insurance lapse? An analysis of the German market.**" *Journal of Risk and Insurance* 81, no. 2 (2014): 241-269.	Empirical Study; Proportional hazards model and generalized linear models (GLM); Two period data of German Life insurer	Life Insurance; Lapse Rate; Policy holder; Product	Product and policy holder characteristics have a statistically significant impact on Lapse rates. There are no major differences between unit-linked and traditional business. Lapse rates for unit-linked annuities are slightly below those of traditional annuities.
Belaygorod, Anatoliy, Atilio Zardetto, and Yuanjin Liu. "**Bayesian modeling of shock lapse rates provides new evidence for emergency fund hypothesis.**" *North American Actuarial Journal* 18.4 (2014): 501-514.	Empirical Study; Regression analysis; Proprietary dataset of U.S; N= 933373	Term life; shocks; lapse; EFH	Study found strong evidence in support of the emergency fund hypothesis
Parsa, Saeed Yazdani, and Tooraj Sadeghi. **"Effect of relationship marketing on word of mouth in life insurance with the approach of trust and commitment: Case Study of Karafarin Insurance Agents in Mashhad.**" *International Journal of Management, Accounting and Economics* 2, no. 10 (2015): 1244-1260.	Empirical Study; Structural equation modeling; survey data; N=384; Iran	Relationship marketing; trust; commitment; word of mouth; Iran	Relationship marketing directly influences life insurance word of mouth. In addition, customers' trust also influences life insurance purchase.
Gottlieb, Daniel, and Kent Smetters. "**Lapse-based insurance.**" Manuscript submitted for publication (2014). Source: https://faculty.wharton.upenn.edu/wp-content/uploads/2016/11/Insurance41.pdf	Empirical Study; Regression analysis; Hand-collected Data; The U.S.; N=10;738	Whole life; shocks; lapse; EFH	Proposed a model of lapsation based on the assumption that insurance consumers do not anticipate changes in their liquidity requirements in the near future. Lapsation profits was highest when the policy is active for about 8 years.
Nithiyalakshmi, A. K. V., M. Ramachandran, and T. Gandhimathi. "**A study on the causes for lapsation of life insurance policies using combined overlap block fuzzy cognitive maps.**" *International Journal of Current Trends in Engineering & Research*, No 2 Issue	Theoretical Paper; Combined Block Fuzzy Cognitive Maps;	Lapsation; Life insurance	Mis-selling of insurance is the primary reason that drives lapsation of policies.

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Nolte, Sven, and Judith C. Schneider. "**Don't lapse into temptation: A behavioral explanation for policy surrender**." *Journal of Banking & Finance* 79 (2017): 12-27.	Empirical Study; Regression; Panel Dara; Germany; N= 3474 households	Life insurance; Emergency fund hypothesis; Financial literacy; Financial advice; Heuristic decision	Behavioral factors such as reliance on heuristics, financial literacy, financial advice affect surrender decisions.

Appendix A(VII)- Financial literacy/ Financial Knowledge

Following literature provides the status of financial literacy among overall population. It also highlights the importance of financial literacy/ Financial

knowledge in life insurance decisions.

Paper	Methodology/ Data	Keywords	Findings
Crosby, L. A., & Stephens, N. (1987). **Effects of relationship marketing on satisfaction, retention, and prices in the life insurance industry**. *Journal of Marketing Research*, 404-411.	Empirical Study; Rational evaluation model (REM); Relationship Generalization Model (RGM); ANOVA; Household Survey Data; N=1362; The U.S.	Whole Life Insurance; Relationship; Marketing	Cash value policies are abstract and complex, returns from such policies are not guaranteed upfront but realized in the future and such returns are difficult to prove. Whole life insurance is a credence product with sales depending on relationship marketing. Unit-linked Policies (ULIP) are risky instruments.
Droms, W. G., & Baldwin, B. G. (1989). **Evaluating the Investment Merits of Life Insurance**. *Journal of Accountancy*, 167(5), 63.	Review Paper	life insurance; decision; investment; product	Linking tax benefits with life insurance and rapid increase in the investment-oriented life insurance products have made the policy choice decision more complex for the customers
Carney, R. J., & Graham, L. (1998). **A current look at the debate: Whole life insurance versus buy term and invest the difference**. *Managerial Finance*, 24(12), 25-44.	Empirical Study; Charting; Life insurer's Data; The U.S.	Life insurance; products; term life; whole life; investment	Buying a term policy and investing the difference in a bank saving yield a higher return than an endowment policy
Dion, K. K., & Dion, K. L. (1993). **Individualistic and collectivistic perspectives on gender and the cultural context of love and intimacy**. *Journal of Social Issues*, 49(3), 53-69.	Conceptual Paper	Conceptual Analysis	Indian society is dominated by collectivistic culture. There exists a large religious and regional diversity in Indian society.
Lusardi, A. (2008). **Financial literacy: an essential tool for informed**	Literature Review	Financial Literacy;	In general, financial literacy is poor worldwide, even simple concepts about savings and investment such as

consumer choice? (No. w14084). *National Bureau of Economic Research*.		Financial Education; Saving Decisions	interest compounding are not known. Financial literacy can improve financial decisions and saving behaviors.
Agarwal, S., Driscoll, J. C., Gabaix, X., & Laibson, D. (2009). **The age of reason: Financial decisions over the life cycle and implications for regulation**. *Brookings Papers on Economic Activity*, 2009(2), 51-117.	Empirical Study; Naïve and Controlled analysis; HRS data; The U.S.	Financial decisions; financial mistakes	It requires high levels of financial knowledge and aptitude to understand complex financial products. Many consumers make mistakes in their financial choices and poor financial decisions result in substantial financial losses to customers
Hung, A., Parker, A. M., &Yoong, J. (2009). **Defining and measuring financial literacy**. *Working Paper*	Empirical Study; Regression; Survey Data; The U.S.; N=2224	Financial literacy; Financial decision; planning	Poor financial decision making is widespread. People with low financial literacy show low involvement in financial planning
Schwarcz, Daniel. **"Insurance demand anomalies and regulation."** *Journal of Consumer Affairs* 44, no. 3 (2010): 557-577.	Literature review	Insurance; anomalies; behavior	Insurance products are complex and insurance decisions are difficult. Consumer often make mistakes in their insurance decisions and their choices are emotionally driven.
Inkmann, J., & Michaelides, A. (2012). **Can the life insurance market provide evidence for a bequest motive?** *Journal of Risk and Insurance*, 79(3), 671-695.	Empirical Study; Probit Model; Survey Data; The U.K; N=4422	life insurance; bequest; tax-incentive; investment	Endowment policies are used for investment due to tax advantage and term policies satisfy bequest motives.
Mohamad, Siti Sarah, Syezreen Dalina Rusdi, Nor Hashima Hashim, and Norhusniyati Husin. **"The influence of intrinsic brand cues in intangible service industries: An application to life insurance services."** *Procedia-Social and Behavioral Sciences* 130 (2014): 347-353.	Empirical Study; factor analysis; survey data; N=132; Malaysia	Malaysia; life insurance; intrinsic brand cue; company reputation; service attributes; media reviews	Results show that company reputation was the most powerful cue that can influence life insurance decision
Chimedtseren, Enkhjargal, and Meysam Safari. **"Service quality factors**	Empirical Study; Factor analysis; Structural	Service Quality;	Lack of problem solving skills and tangibility are the main issue of service quality towards increasing

affecting purchase intention of life insurance products." *Journal of Insurance and Financial Management* (2016).	equation modeling; survey data; N=215; Malaysia	Purchase intention; Life insurance products; Malaysia	customer satisfaction. Relationship between tangibility, reliability, responsiveness, problem solving and helpfulness on purchase intention were found to be non-significant except.
Eun, Cheol S., Lingling Wang, and Steven C. Xiao. (2015)"**Culture and R2**." *Journal of Financial Economics* 115, no. 2: 283-303.	Empirical Study; Regression; Panel data; 47 countries	Culture; Individualism; Openness	A herd mentality is often observed in the financial behavior in nations with collectivistic culture

Appendix B - New Consumer Classification System

The New Consumer Classification System was developed to segment the Indian consumers based on their purchasing power. It was co-developed by the Market Research Society of India (MRSI) and the Media Research Users Council (MRUC) in 2011. The previous SEC Classification system developed in 1988 had the Urban SEC grid and the Rural SEC grid. It used the education and occupation of the head of the household in urban households and education of the head of the household and type of house in rural households.

Unlike the previous SEC system, the NCCS is uniform across rural and urban households. It uses two parameters namely *education of the head of the household and number of durables owned* (from a pre-defined list of durables) by the household to determine the socioeconomic class of the household.

Table B.1 SEC System

	Education Levels						
Durables owned	**Illiterate**	**Literate but formal Education <4 Years**	**School: 5 to 9 Years**	**HSC /SSC**	**Some College (Including Diploma) but not grad.**	**Graduate / Postgrad General**	**Graduate Postgrad Professional**
None	E3	E2	E2	E2	E2	E1	D2
1	E2	E1	E1	E1	D2	D2	D2
2	E1	E1	D2	D2	D1	D1	D1
3	D2	D2	D1	D1	C2	C2	C2
4	D1	C2	C2	C1	C1	B2	B2
5	C2	C1	C1	B2	B1	B1	B1
6	C1	B2	B2	B1	A3	A3	A3
7	C1	B1	B1	A3	A3	A2	A2
8	B1	A3	A3	A3	A2	A2	A2
9+	B1	A3	A3	A2	A2	A1	A1

New SEC classification system consists of 12 grades (A1 to E3) where A1 represents the highest grade and E3 represents the lowest. Education of the head of the household has 7 categories where illiterate is the lowest category and a professional graduate/post-graduate degree is the highest category. The criteria for SEC classification were developed with the goal of having the highest discriminatory power.

The list of pre-defined consumer durables consists of 11 items; *electricity connection, ceiling fan, gas stove, two-wheeler, color TV, refrigerator, washing machine, computer/laptop, four-wheeler (car/jeep/van), air conditioner and agricultural land.*

Appendix C
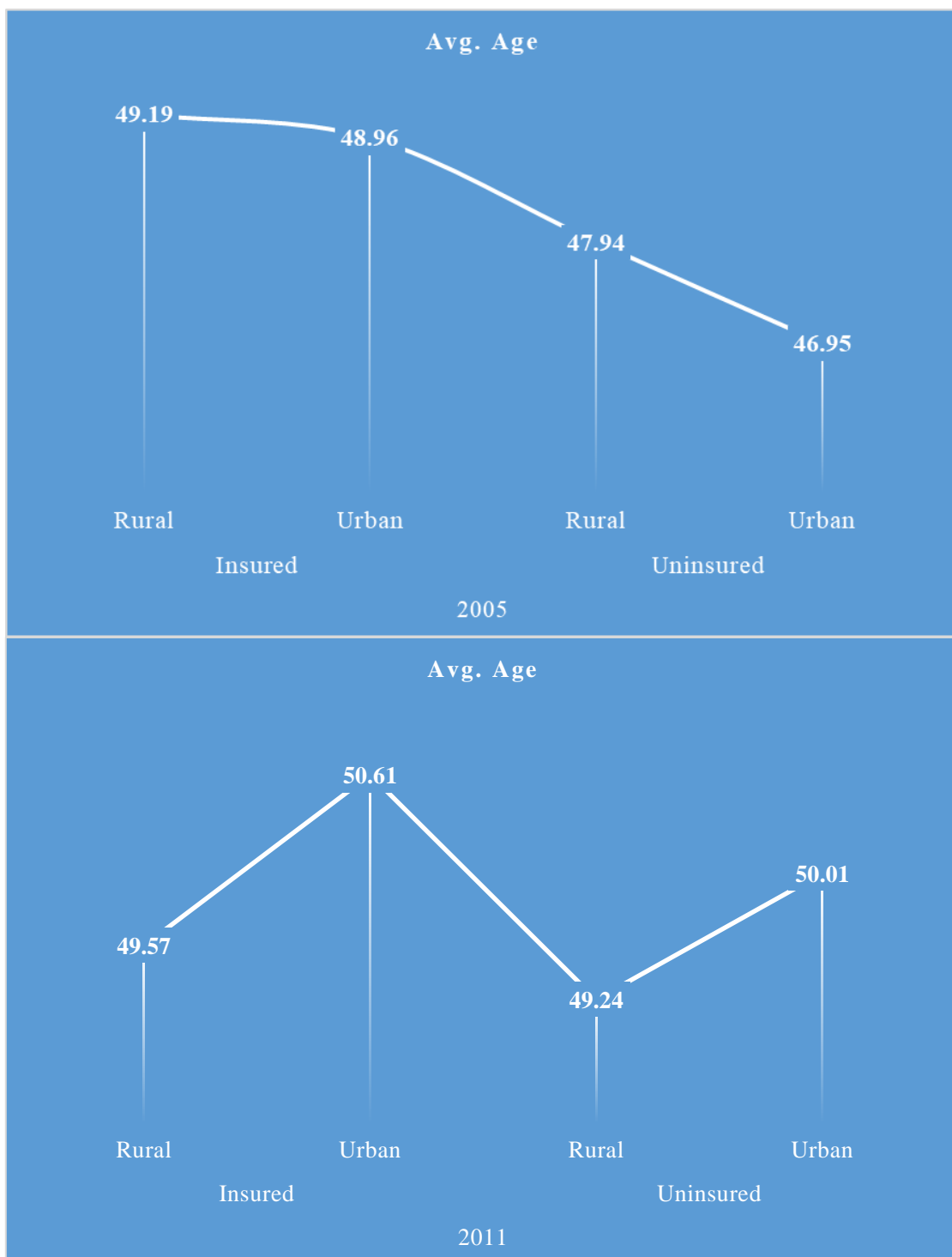
Figure C.1 Age Comparison between Insured and Uninsured
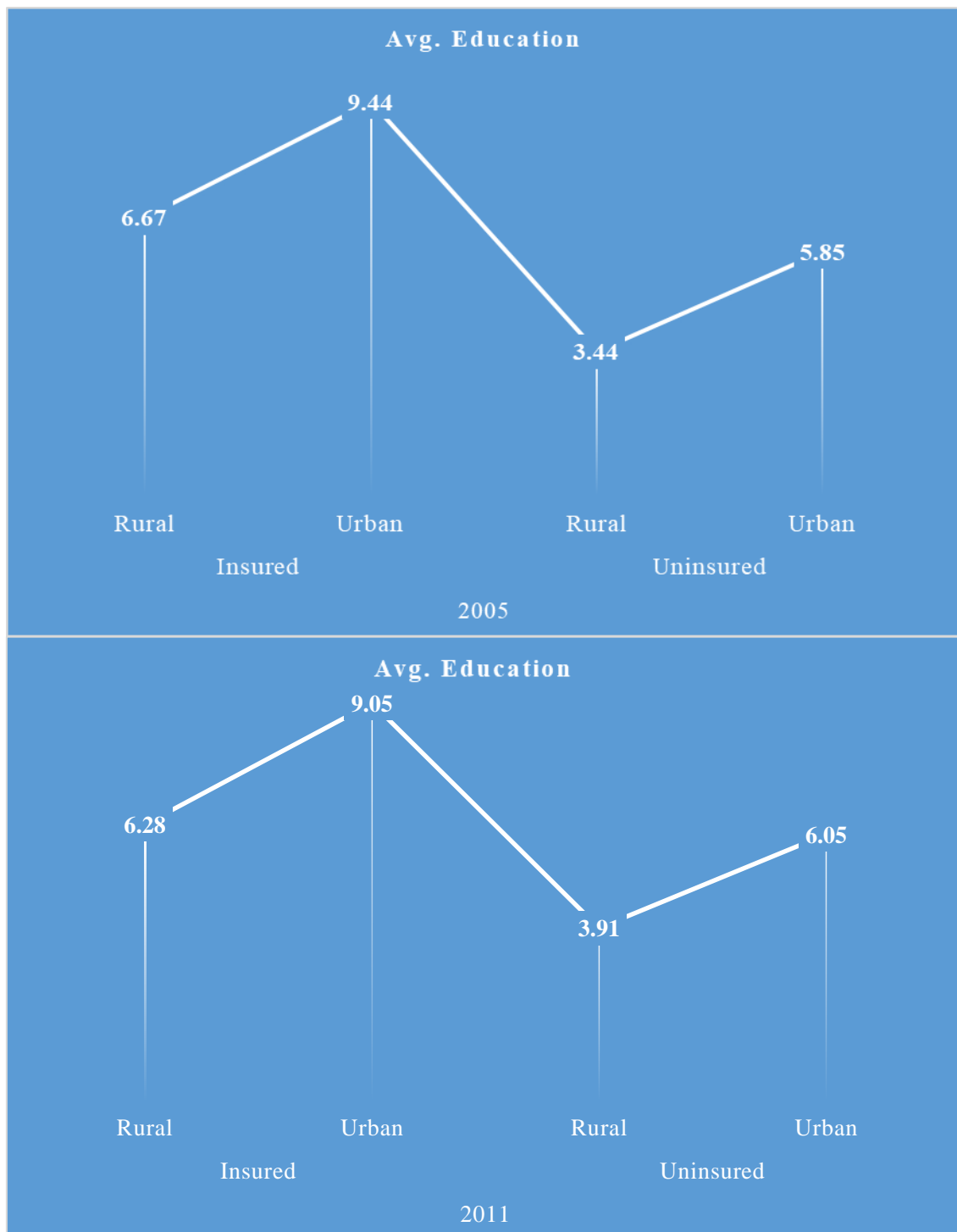
Appendix C (contd.)

Figure C.2 Educational difference between Insured and Uninsured

Appendix C (contd.)

FigureC.3 Income Comparison between Insured and Uninsured
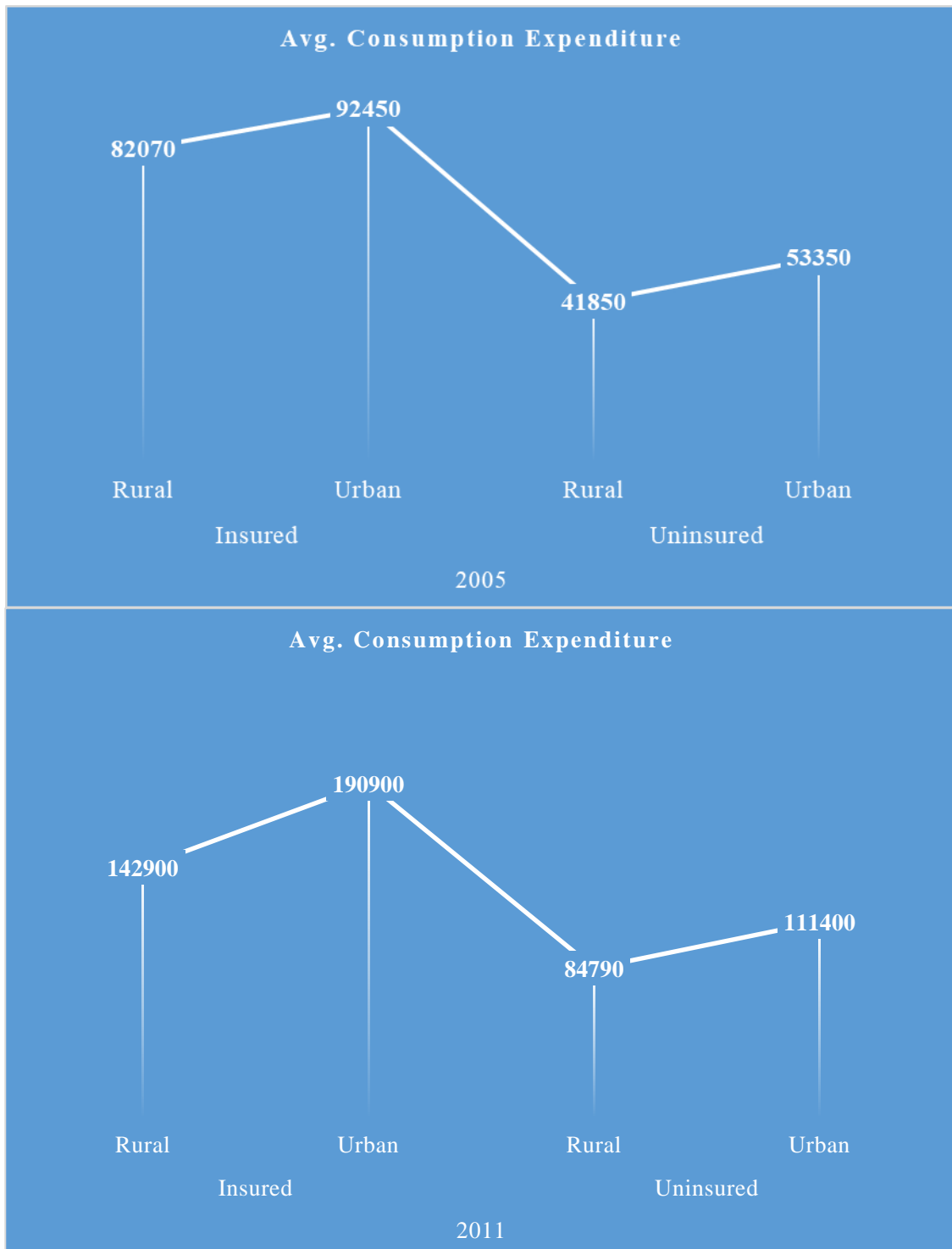
Appendix C (contd.)

FigureC.4 Difference in Consumption Expenditure of Insured and Uninsured

Appendix C (contd.)

Avg. Family Size

6.65

5.54

5.93

5.42

| Rural | Urban | Rural | Urban |

Insured   Uninsured

2005

Avg. Family Size

5.20

4.90

4.79

4.73

| Rural | Urban | Rural | Urban |

Insured   Uninsured

2011
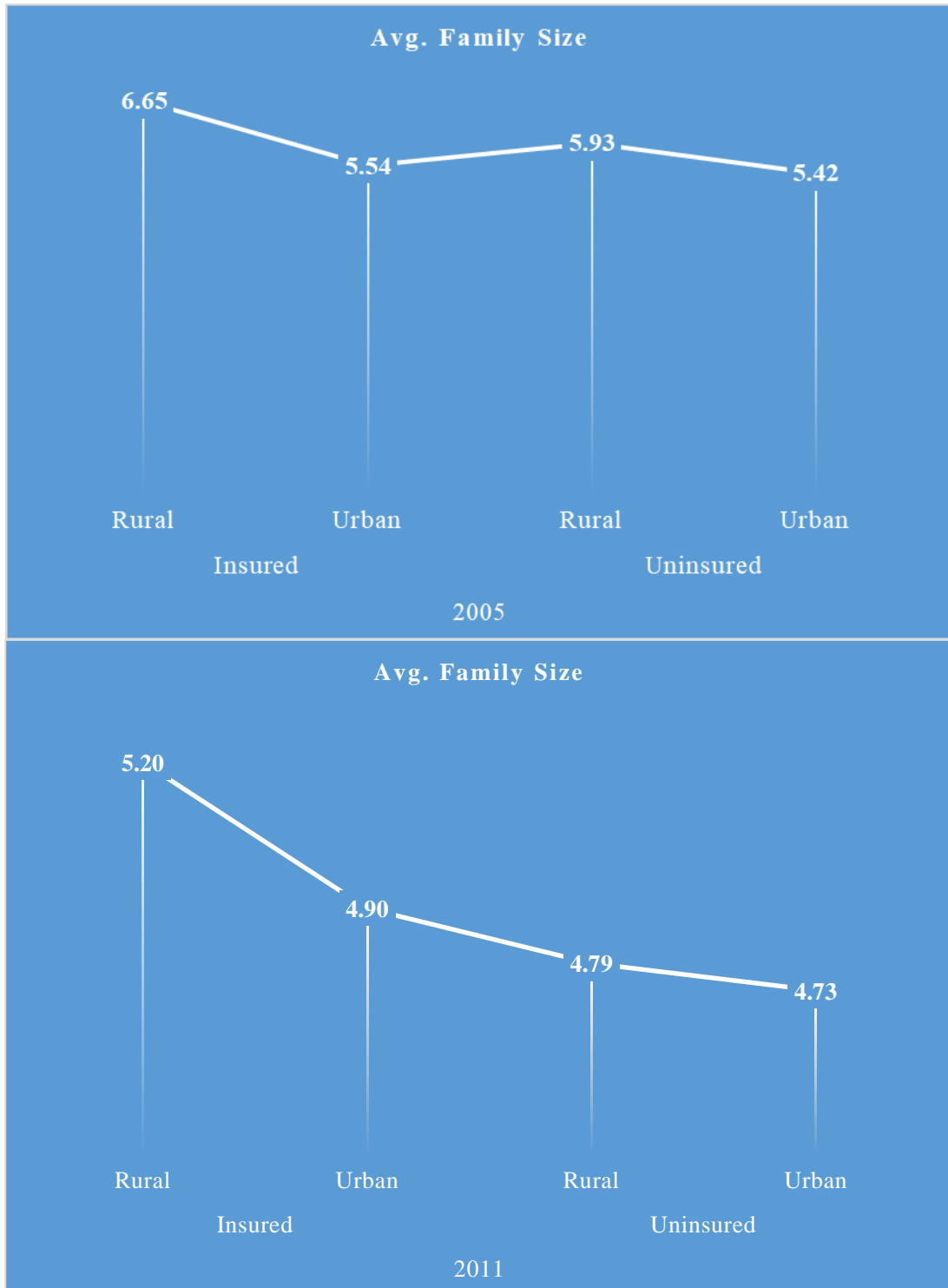
FigureC.5 Family size Comparison between Insured and Uninsured

Appendix C (contd.)
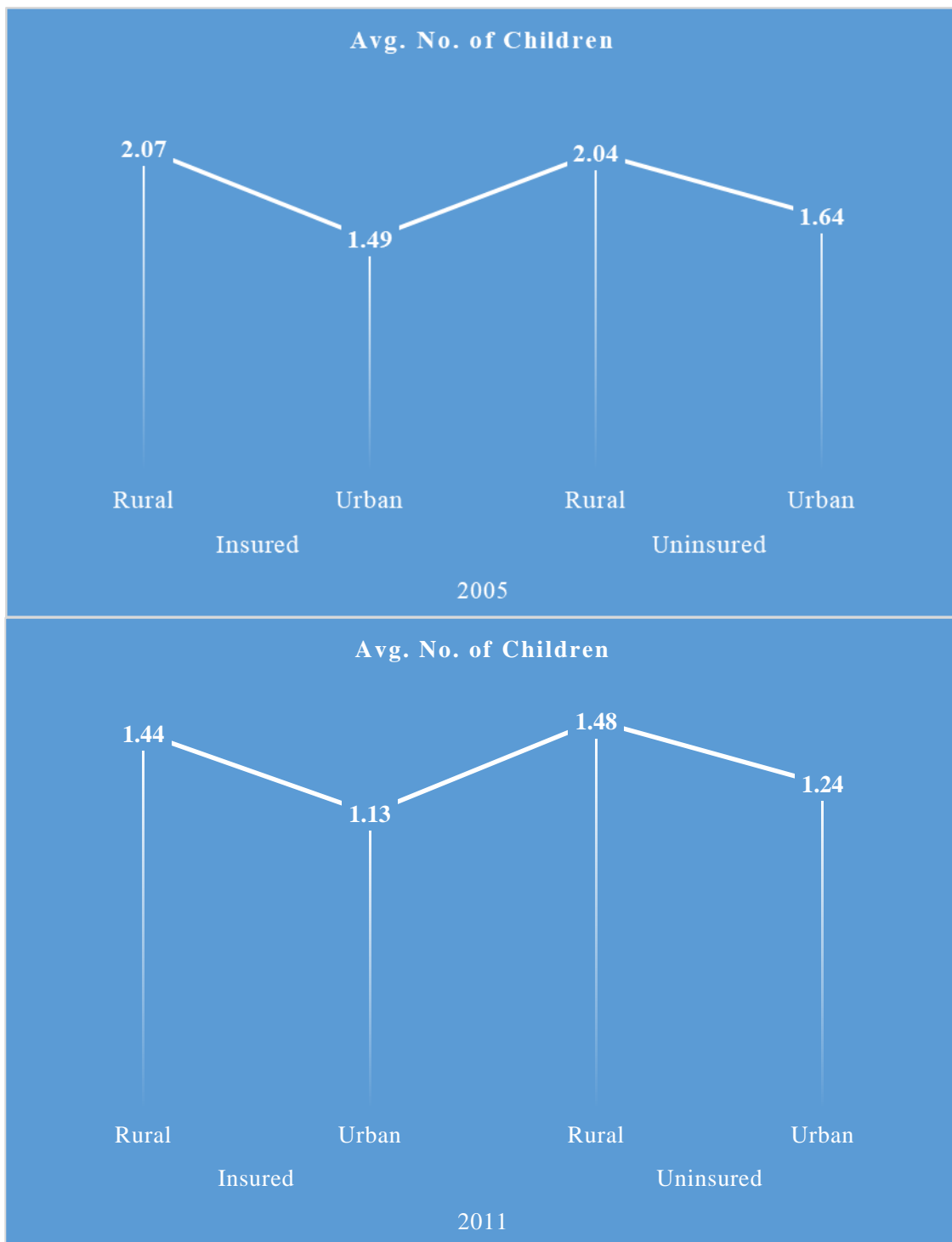
Figure C.6 Difference in number of Children between Insured and Uninsured

Appendix D

Table D.1 Step wise Backward Logistic Regression Models

Coefficients:	Model 1		Model 2		Model 3		Model 4	
	β	sig.	β	sig.	β	sig.	β	sig.
(Intercept)	-6.35	***	-2.61	***	-4.57	***	-6.59	***
LN_INCOME05	0.38	***			0.21	***	0.37	***
PER_C_INCOME	0.08	***	0.04	***			0.08	***
HEADAGE11	-0.01	***	-0.01	***	-0.01	***		
HEADSEX112	0.13	*	0.09		0.12	*	0.14	**
FAMILY_SIZE_CHNG	0.31	***	0.25	***	0.36	***	0.28	***
URBAN111	0.27	***	0.31	***	0.27	***	0.27	***
HEAD_EDUCATION11	0.03	***	0.03	***	0.03	***	0.04	***
NMARRIED1	-0.36	.	-0.33		-0.36	.	-0.29	
NEW_CHILD1	0.04		0.10	*	0.04		0.06	
WIDOWED1	-0.06		-0.04		-0.06		-0.11	
POOR1	-0.73	***	-0.77	***	-0.77	***	-0.72	***
ACQUIRED_BPL1	-0.07	.	-0.10	*	-0.09	*	-0.07	
ACQUIRED_BANK_AC1	0.25	***	0.24	***	0.25	***	0.26	***
ACQUIRED_BANK_LOAN1	0.36	***	0.38	***	0.38	***	0.35	***
SEC052	0.41	***	0.47	***	0.44	***	0.40	***
SEC053	0.48	***	0.60	***	0.54	***	0.46	***
SEC054	0.71	***	0.91	***	0.80	***	0.68	***
SEC055	0.82	***	1.09	***	0.94	***	0.77	***
SEC056	0.97	***	1.33	***	1.12	***	0.92	***
SEC057	1.01	***	1.44	***	1.18	***	0.95	***
SEC058	1.33	***	1.82	***	1.53	***	1.25	***
SEC059	1.35	***	1.90	***	1.58	***	1.26	***
SEC0510	1.63	***	2.31	***	1.91	***	1.53	***
SEC0511	1.71	***	2.53	***	2.04	***	1.59	***
SEC0512	1.36	**	2.41	***	1.85	***	1.22	*
SEC_IMP1	0.57	***	0.64	***	0.63	***	0.57	***
SEC_IMP2	-0.31	***	-0.34	***	-0.34	***	-0.30	***
N=27599								
AIC	25202		25441		25391		25225	
DIFFERENCE			-239		-189		-23	

Appendix D (contd.)

Table D.2 Step wise Backward Logistic Regression Models

Coefficients:	Model 5		Model 6		Model 7		Model 8	
	β	sig.	β	sig.	β	sig.	β	sig.
(Intercept)	-6.29	***	-6.30	***	-6.47	***	-6.15	***
LN_INCOME05	0.38	***	0.36	***	0.40	***	0.38	***
PER_C_INCOME	0.08	***	0.08	***	0.08	***	0.08	***
HEADAGE11	-0.01	***	0.00	***	-0.01	***	-0.01	***
HEADSEX112			0.13	*	0.15	**	0.07	
FAMILY_SIZE_CHNG	0.30	***			0.32	***	0.30	***
URBAN111	0.27	***	0.28	***			0.28	***
HEAD_EDUCATION11	0.03	***	0.03	***	0.03	***		
NMARRIED1	-0.36	.	-0.23		-0.34		-0.32	
NEW_CHILD1	0.04		0.22	***	0.02		0.04	
WIDOWED1	0.02		-0.10		-0.05		-0.07	
POOR1	-0.73	***	-0.70	***	-0.67	***	-0.73	***
ACQUIRED_BPL1	-0.07	.	-0.06		-0.07		-0.08	.
ACQUIRED_BANK_AC1	0.24	***	0.24	***	0.24	***	0.24	***
ACQUIRED_BANK_LOAN1	0.36	***	0.37	***	0.34	***	0.36	***
SEC052	0.41	***	0.41	***	0.41	***	0.45	***
SEC053	0.48	***	0.48	***	0.51	***	0.56	***
SEC054	0.71	***	0.71	***	0.77	***	0.84	***
SEC055	0.82	***	0.82	***	0.89	***	0.99	***
SEC056	0.98	***	0.97	***	1.06	***	1.15	***
SEC057	1.01	***	1.02	***	1.10	***	1.23	***
SEC058	1.34	***	1.35	***	1.45	***	1.60	***
SEC059	1.36	***	1.37	***	1.48	***	1.66	***
SEC0510	1.64	***	1.67	***	1.77	***	1.98	***
SEC0511	1.72	***	1.75	***	1.88	***	2.13	***
SEC0512	1.37	**	1.43	**	1.50	**	1.86	***
SEC_IMP1	0.57	***	0.59	***	0.58	***	0.62	***
SEC_IMP2	-0.31	***	-0.33	***	-0.33	***	-0.36	***
N=27599								
AIC	25206		25271		25252		25247	
DIFFERENCE	-4		-69		-50		-45	

Appendix D (contd.)

Table D.3 Step wise Backward Logistic Regression Models

Coefficients:	Model 9		Model 10		Model 11		Model 12	
	β	sig.	β	sig.	β	sig.	β	sig.
(Intercept)	-6.36	***	-6.36	***	-6.34	***	-7.05	***
LN_INCOME05	0.38	***	0.38	***	0.38	***	0.41	***
PER_C_INCOME	0.08	***	0.08	***	0.08	***	0.09	***
HEADAGE11	-0.01	***	-0.01	***	-0.01	***	-0.01	***
HEADSEX112	0.13	*	0.13	*	0.11	*	0.17	**
FAMILY_SIZE_CHNG	0.30	***	0.32	***	0.31	***	0.26	***
URBAN111	0.27	***	0.26	***	0.27	***	0.15	***
HEAD_EDUCATION11	0.03	***	0.03	***	0.03	***	0.03	***
NMARRIED1			-0.35	.	-0.36	.	-0.30	
NEW_CHILD1	0.04				0.04		-0.04	
WIDOWED1	-0.06		-0.06				-0.08	
POOR1	-0.72	***	-0.72	***	-0.73	***		
ACQUIRED_BPL1	-0.07	.	-0.07	.	-0.07	.	-0.10	*
ACQUIRED_BANK_AC1	0.25	***	0.25	***	0.25	***	0.24	***
ACQUIRED_BANK_LOAN1	0.36	***	0.36	***	0.36	***	0.38	***
SEC052	0.41	***	0.41	***	0.41	***	0.45	***
SEC053	0.48	***	0.48	***	0.48	***	0.59	***
SEC054	0.71	***	0.72	***	0.71	***	0.88	***
SEC055	0.81	***	0.82	***	0.82	***	1.03	***
SEC056	0.97	***	0.97	***	0.97	***	1.22	***
SEC057	1.01	***	1.01	***	1.01	***	1.28	***
SEC058	1.33	***	1.33	***	1.33	***	1.62	***
SEC059	1.35	***	1.35	***	1.35	***	1.67	***
SEC0510	1.63	***	1.63	***	1.63	***	1.97	***
SEC0511	1.71	***	1.71	***	1.71	***	2.08	***
SEC0512	1.36	**	1.36	**	1.36	**	1.73	**
SEC_IMP1	0.57	***	0.57	***	0.57	***	0.64	***
SEC_IMP2	-0.31	***	-0.31	***	-0.32	***	-0.34	***
N=27599								
AIC	25203		25201		25201		25504	
DIFFERENCE	-1		1		1		-302	

Appendix D (contd.)

Table D.4 Step wise Backward Logistic Regression Models

Coefficients:	Model 13		Model 14		Model 15		Model 16		Model 17	
	β	sig.	β	sig.	β	sig.	β	sig.		
(Intercept)	-6.38	***	-6.22	***	-6.41	***	-7.58	***	-6.65	***
LN_INCOME05	0.38	***	0.38	***	0.39	***	0.54	***	0.45	***
PER_C_INCOME	0.08	***	0.08	***	0.08	***	0.09	***	0.09	***
HEADAGE11	-0.01	***	-0.01	***	-0.01	***	0.00	*	0.00	***
HEADSEX112	0.13	*	0.12	*	0.12	*	0.17	**	0.13	*
FAMILY_SIZE _CHNG	0.30	***	0.30	***	0.31	***	0.32	***	0.36	***
URBAN111	0.27	***	0.25	***	0.25	***	0.39	***	0.32	***
HEAD_ EDUCATION11	0.03	***	0.03	***	0.03	***	0.06	***	0.05	***
NMARRIED1	-0.35	.	-0.41	.	-0.36	.	-0.37	.	-0.40	.
NEW_CHILD1	0.04		0.04		0.04		0.04		0.03	
WIDOWED1	-0.06		-0.06		-0.06		-0.06		-0.10	
POOR1	-0.73	***	-0.72	***	-0.74	***	-0.85	***	-0.82	***
ACQUIRED_BPL1			-0.07		-0.08	.	-0.09	*	-0.09	*
ACQUIRED_ BANK_AC1	0.25	***			0.26	***	0.25	***	0.28	***
ACQUIRED_ BANK_LOAN1	0.36	***	0.37	***			0.40	***	0.40	***
SEC052	0.41	***	0.42	***	0.42	***			0.32	***
SEC053	0.48	***	0.50	***	0.51	***			0.33	***
SEC054	0.72	***	0.74	***	0.74	***			0.50	***
SEC055	0.82	***	0.84	***	0.85	***			0.53	***
SEC056	0.97	***	0.99	***	1.01	***			0.63	***
SEC057	1.01	***	1.02	***	1.05	***			0.59	***
SEC058	1.33	***	1.34	***	1.37	***			0.82	***
SEC059	1.36	***	1.36	***	1.40	***			0.75	***
SEC0510	1.64	***	1.62	***	1.69	***			0.86	***
SEC0511	1.72	***	1.70	***	1.77	***			0.75	***
SEC0512	1.37	**	1.33	*	1.40	**			0.13	
SEC_IMP1	0.57	***	0.58	***	0.58	***	0.42	***		
SEC_IMP2	-0.31	***	-0.32	***	-0.32	***	-0.16	*		
N=27599										
AIC	25203		25252		25265		25398		25521	
DIFFERENCE	-1		-50		-63		-196		-319	

Appendix E

Table E.1 Step wise Backward (Nested) Logistic Regression Models for Insurance Acquisition

Coefficients:	Model 1		Model 2		Model 3	
	β	sig.	β	sig.	β	sig.
(Intercept)	-6.35	***	-2.54	***	-6.51	***
LN_INCOME05	0.38	***			0.37	***
PER_C_INCOME	0.08	***			0.08	***
HEADAGE11	-0.01	***	0.00	***		
HEADSEX112	0.13	*	0.09			
FAMILY_SIZE_CHNG	0.31	***	0.30	***		
URBAN111	0.27	***	0.31	***		
HEAD_EDUCATION11	0.03	***	0.03	***		
NMARRIED1	-0.36	.	-0.34	.		
NEW_CHILD1	0.04		0.08	.		
WIDOWED1	-0.06		-0.05			
POOR1	-0.73	***	-0.79	***	-0.60	***
ACQUIRED_BPL1	-0.07	.	-0.10	*	-0.07	
ACQUIRED_BANK_AC1	0.25	***	0.24	***	0.23	***
ACQUIRED_BANK_LOAN1	0.36	***	0.38	***	0.34	***
SEC052	0.41	***	0.47	***	0.45	***
SEC053	0.48	***	0.60	***	0.57	***
SEC054	0.71	***	0.90	***	0.89	***
SEC055	0.82	***	1.09	***	1.07	***
SEC056	0.97	***	1.33	***	1.24	***
SEC057	1.01	***	1.43	***	1.33	***
SEC058	1.33	***	1.80	***	1.71	***
SEC059	1.35	***	1.89	***	1.78	***
SEC0510	1.63	***	2.30	***	2.12	***
SEC0511	1.71	***	2.50	***	2.31	***
SEC0512	1.36	**	2.42	***	2.04	***
SEC_IMP1	0.57	***	0.66	***	0.67	***
SEC_IMP2	-0.31	***	-0.35	***	-0.39	***
N=27599						
AIC	25202		25494		25446	
DIFFERENCE			-292		-244	

Appendix E (contd.)

Table E.2 Step wise Backward (Nested) Logistic Regression Models for Insurance Acquisition

Coefficients:	Model 4		Model 5		Model 6	
	β	sig.	β	sig.	β	sig.
(Intercept)	-7.09	***	-6.27	***	-7.22	***
LN_INCOME05	0.42	***	0.38	***	0.53	***
PER_C_INCOME	0.09	***	0.08	***	0.10	***
HEADAGE11	-0.01	***	-0.01	***	0.00	*
HEADSEX112	0.17	**	0.11	*	0.15	**
FAMILY_SIZE_CHNG	0.26	***	0.30	***	0.36	***
URBAN111	0.15	***	0.23	***	0.38	***
HEAD_EDUCATION11	0.03	***	0.03	***	0.07	***
NMARRIED1	-0.30		-0.42	*	-0.39	.
NEW_CHILD1	-0.04		0.04		0.03	
WIDOWED1	-0.08		-0.06		-0.09	
POOR1			-0.73	***	-0.88	***
ACQUIRED_BPL1			-0.07		-0.10	*
ACQUIRED_BANK_AC1	0.24	***			0.28	***
ACQUIRED_BANK_LOAN1	0.38	***			0.42	***
SEC052	0.46	***	0.43	***		
SEC053	0.59	***	0.53	***		
SEC054	0.89	***	0.77	***		
SEC055	1.03	***	0.88	***		
SEC056	1.22	***	1.04	***		
SEC057	1.28	***	1.06	***		
SEC058	1.62	***	1.38	***		
SEC059	1.67	***	1.40	***		
SEC0510	1.98	***	1.68	***		
SEC0511	2.09	***	1.76	***		
SEC0512	1.74	***	1.38	**		
SEC_IMP1	0.64	***	0.59	***		
SEC_IMP2	-0.34	***	-0.33	***		
N=27599						
AIC	25507		25321		25582	
DIFFERENCE	-305		-119		-380	

Appendix F

Table F.1 Step wise Backward (Nested) Logistic Regression Models for Insurance Discontinuation

Coefficients:	Model 1		Model 2		Model 3	
	β	sig.	β	sig.	β	sig.
(Intercept)	3.73	***	0.66	*	4.01	***
LN_INCOME05	-0.30	***			-0.27	***
PER_C_INCOME	-0.12	***			-0.13	***
HEADAGE11	0.01	***	0.01	**		
HEADSEX112	-0.07		-0.08			
FAMILY_SIZE_CHNG	-0.53	***	-0.58	***		
URBAN111	-0.21	***	-0.23	***		
HEAD_EDUCATION11	-0.01		-0.01			
NMARRIED1	0.43		0.46			
NEW_CHILD1	0.10		0.08			
WIDOWED1	0.08		0.09			
POOR1	0.73	***	0.77	***	0.60	***
ACQUIRED_BPL1	0.03		0.06		0.03	
ACQUIRED_BANK_AC1	-0.07		-0.05		-0.06	
ACQUIRED_BANK_LOAN1	-0.51	***	-0.53	***	-0.50	***
SEC052	0.01		-0.03		-0.05	
SEC053	-0.20		-0.29		-0.26	
SEC054	-0.51	*	-0.64	**	-0.63	**
SEC055	-0.57	*	-0.73	**	-0.72	**
SEC056	-0.77	**	-1.01	***	-0.94	***
SEC057	-0.89	***	-1.17	***	-1.07	***
SEC058	-0.96	***	-1.28	***	-1.18	***
SEC059	-1.17	***	-1.53	***	-1.43	***
SEC0510	-1.21	***	-1.67	***	-1.47	***
SEC0511	-1.50	***	-2.05	***	-1.85	***
SEC0512	-1.83	***	-2.48	***	-2.25	***
SEC_IMP1	-0.48	***	-0.56	***	-0.54	***
SEC_IMP2	0.40	***	0.47	***	0.48	***
N=27599						
AIC	8792.1		8894.5		8866.5	
DIFFERENCE	3.3		-99.1		-71.1	

Appendix F (contd.)

Table F.2 Step wise Backward (Nested) Logistic Regression Models for Insurance Discontinuation

Coefficients:	Model 4		Model 5		Model 6	
	β	sig.	β	sig.	β	sig.
(Intercept)	4.22	***	3.69	***	4.60	***
LN_INCOME05	-0.31	***	-0.30	***	-0.43	***
PER_C_INCOME	-0.13	***	-0.12	***	-0.15	***
HEADAGE11	0.01	***	0.01	***	0.01	**
HEADSEX112	-0.11		-0.05		-0.11	
FAMILY_SIZE_CHNG	-0.47	***	-0.53	***	-0.64	***
URBAN111	-0.13	*	-0.19	***	-0.29	***
HEAD_EDUCATION11	-0.01		-0.01		-0.04	***
NMARRIED1	0.40		0.44		0.44	
NEW_CHILD1	0.15	*	0.10		0.12	
WIDOWED1	0.10		0.08		0.12	
POOR1			0.75	***	0.91	***
ACQUIRED_BPL1			0.04		0.05	
ACQUIRED_BANK_AC1	-0.07				-0.06	
ACQUIRED_BANK_LOAN1	-0.53	***			-0.54	***
SEC052	-0.03		-0.02			
SEC053	-0.30		-0.25			
SEC054	-0.64	**	-0.57	*		
SEC055	-0.74	**	-0.63	**		
SEC056	-0.99	***	-0.83	***		
SEC057	-1.13	***	-0.95	***		
SEC058	-1.23	***	-1.03	***		
SEC059	-1.46	***	-1.23	***		
SEC0510	-1.53	***	-1.29	***		
SEC0511	-1.85	***	-1.57	***		
SEC0512	-2.22	***	-1.85	***		
SEC_IMP1	-0.53	***	-0.49	***		
SEC_IMP2	0.45	***	0.41	***		
N=27599						
AIC	8870		8842.4		8915.6	
DIFFERENCE	-74.6		-47		-120.2	

Appendix G- Insurance Questionnaire

Please provide either email id or mobile number or both

(whichever you wish – one is necessary)

Mobile/ Email (Required)_____

Age
- Under 18 years old,
- 18-24 years old
- 25-34 years old
- 35-44 years old
- 45-55 years old
- Above 55 years old

Gender
- Male
- Female

Marital and Family Status
- Single
- Married without children
- Family with dependent children
- Family with independent children

Education: What is the highest degree you have completed?
- Non-matriculate
- High School (Matriculation/ 12th)
- Bachelor's Degree
- Professional/Master's Degree
- Doctorate Degree

Employment Status
- Student
- Looking for work
- Homemaker
- Employed (salaried)
- Self-Employed (Business / freelance / others)
- Retired

Household monthly income
- Less than Rs. 10,000/month
- Rs. 10,000 – Rs. 25,000/month
- Rs. 25,001 – Rs. 50,000/month
- Rs. 50,001-Rs. 1 lakh/month
- More than Rs. 1 Lakh / month
- Would rather not say

Approx. monthly expenditure (for household):   _____
Number of earners in the family: _____
No. of dependents (include children, older parents): _____
Name of village/town/city where you live:_____
Do you have your own house: Yes/No
Vehicle Ownership (tick all that apply): No / Two wheeler / Four wheeler
Do you have a bank account?   Yes/No

Questions regarding life insurance policies:

1. Please check the one that applies
   2. I have a life insurance policy (policies) currently
   3. I do not have a life insurance policy now and do not intend to get one
   4. I do not have a life insurance policy now and intend to get one later
   5. I had a life insurance policy which has lapsed
   6. I had a life insurance policy which has matured
7. If you have (had) an insurance policy, do you have (Tick all that apply)
   - Term plan
   - Endowment plan
   - Children's education plan
   - Unit-Linked Insurance Plan
   - Retirement Plan
   - Don't know
8. What is the name of the company from which you have bought your life insurance policy _____
9. If your policy lapsed, how long after you took the policy did it lapse?
   10. Less than two years
   11. 2-4 years
   12. 4-6 years
   13. 6-8 years
   14. More than 8 years
   15. Cannot remember

16. What was the reason it lapsed? (Tick all that apply)
   17. I forgot to pay the premium
   18. I could not afford the premium
   19. It did not meet my investment needs
   20. I felt I had made a mistake when purchasing the policy.
   21. I felt that the original reason for taking the insurance policy was not relevant any more.
   22. Other _____

Please indicate how much you agree or disagree with each of the following statements regarding life insurance policies.

		Constructs	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Insurance agent(s) have explained to me the benefits of putting money in life insurance.	SN					
2	Several of my friends and relatives think that one should buy life insurance policies.	SN					
3	I think that in the event of death of the policy holder, it is sometimes difficult to get the claim payment from life insurance companies.	Belief					
4	I think it is very important to have a Life Insurance policy for the security of one's family.	Belief					
5	Life insurance is good for saving for retirement and children's education.	Attitude					
6	Life insurance is a good tax-saving scheme	Attitude					
7	It is difficult for me to remember to make regular premium payments.	PBC					
8	My family members think taking a life insurance policy is necessary.	SN					
9	Life insurance provides support in an emergency, such as illness or death	Belief					
10	I feel that I will not be able to choose the correct life insurance policy for my needs.	PBC					
11	I think that in general LIC agents are trustworthy.	Belief					
12	I feel that I cannot afford to pay life insurance premiums.	PBC					
13	I feel life insurance is a good investment option compared to other options.	Attitude					
14	I think that in general insurance agents from other companies (other than LIC) are trustworthy.	SN					
15	If the insurance agents (or bank officials) insist that I should take a policy, I cannot refuse.	SN					
16	I know the difference between the different schemes such as "Term Plan" and "Endowment Plan"	Product Knowledge					
17	I know the difference between the different schemes such as "Endowment Plan" and ULIP.	Product Knowledge					

Answer the following only if you have bought a life insurance policy in the past. For each of the following reasons, indicate how important they were for you when you bought the insurance policy

	Reason for buying Life Insurance Policy	Not Important	Slightly Important	Moderately Important	Important	Very Important
1	To save for future needs like children's education/my retirement.					
2	To save some amount regularly so that I do not spend it all.					
3	It helps to secure the future of my family in case of death.					
4	To save income tax.					
5	The life insurance agents convinced me that I should take a policy.					
6	Life insurance purchase was needed in order to get some loans/services from the bank.					
7	Knowing the life insurance agent socially, I felt a social obligation to invest in an insurance policy.					

Please answer the following with regard to your satisfaction with the life insurance policy (policies) you bought.

		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	I am happy with the policy I have purchased.					
2	I would advise my friends and family members to purchase insurance policy from the same company.					
3.	I am not happy with my insurance policy and would like to discontinue.					

Appendix H- Map of the Cities and Villages from which Data was Collected

Figure H.1 Map of the Areas of Study

Cities: Ahmedabad, Aligarh, Allahabad, Bangalore, Bhubaneswar, Bikaner, Bokaro, Chennai, Delhi, Gorakhpur, Gurgaon, Hyderabad, Jaipur, Kanpur, Kolkata, Lucknow, Mumbai, Nainital, Pune, Surat, Udaipur and Varanasi.

Villages: Alwar, Basuhar, Bhakhar, Bhimtal, Bhowali, Bohrakun, Dhungsil, Haldwani, Jangaliya Gaon, Jantwal Gaon, Jathiya, Katra, Kaushambi, Khutani, Maluataal, Naukuchiyatal, Pandey Gaon, Rawat Gaon, Rudrapur, Sanguri Gaon - these villages are all in the northern states of Uttar Pradesh and Uttaranchal.

Appendix I- Reported Reasons for Life Insurance Policy Lapse

Table I.1 Reasons for Life Insurance Policy Lapse

Lapse Reasons	Frequency
I felt that the original reason for taking the insurance policy was not relevant any more.	44
I forgot to pay the premium.	20
I could not afford the premium.	18
It did not meet my investment needs.	7
I could not afford the premium. I felt I had made a mistake when purchasing the policy.	3
I felt I had made a mistake when purchasing the policy.	2
I could not afford the premium. It did not meet my investment needs. I felt I had made a mistake when purchasing the policy.	1
I felt I had made a mistake when purchasing the policy. I felt that the original reason for taking the insurance policy was not relevant any more.	1
Cheated by the Agent	1
I forgot to pay the premium. Happened with only one policy.	1
I forgot to pay the premium. I could not afford the premium.	1
I forgot to pay the premium. I felt that the original reason for taking the insurance policy was not relevant any more.	1
It did not meet my investment needs. I felt that the original reason for taking the insurance policy was not relevant any more.	2
Total	102

Appendix J- List of Variables available in Indian Household Development Survey (IHDS)

Variables	Description
HHID	Household ID
STATEID	State ID
DISTID	District ID
PSUID	PSU ID
HHIDN	Household identifier
HHSPLITID	Household Split ID
UID	Unique household ID
ID14	Main income source
AN1	Owns livestock
NF5	Business 1: Net income (rupees)
NF25	Business 2: Net income (rupees)
IN3A	Income: Government pension (rupees)
IN3B	Income: Private pension (rupees)
HIGVT	Health Insurance government
HIPVT	Health Insurance private
IN15C1	Crop Insurance government
IN15C2	Crop Insurance private
IN15E1	Kisan credit card
IN16	N NREGA job cards
RC1B1	Ration card type: BPL
RC3C	Anyone in the household have: Rastriya Swasthya Bima Yojana (RSBY) card
CO30A	House loan installment: Total value Rs
CO50	Insurance premiums: Total value Rs
COTOTAL	Total household consumption expenditure
CG21	Own: Car
DB8A	Apply to bank
DB9B	Invest in expanding property/house
DB9C	Bought securities
DB9D	Fixed Deposit
DB9E	Bank savings
DB9F	Credit society
DB9G	Post Office Account
DB9H	Pension, LIC, other

Appendix J (contd.)

Variables	Description
URBAN2011	Urban residence from census 2011
NPERSONS	N in household
FM22RSHH	Crop income
FM33IRS	Agricultural loan interest @15%
INCCROP	Income from crops minus expenses
INCAG	Income from agriculture minus expenses
INCBUS	All businesses: Net income
INCOTHER	Income from property, pensions (rupees)
WS10HH	Annual household Rs from daily/monthly wage
INCOME	Total income
MHEADAGE	Age of male head
FHEADAGE	Age of female head
NCHILDM	Boys in household
NCHILDF	Girls in household
HHEDUC	Highest adult education
HHEDUCM	Highest male adult education
HHEDUCF	Highest female adult education
LIFEINS	Life insurance
LIGVT	Life Insurance government
LIPVT	Life Insurance private
HEADEDUC	Number of years of education of household Head
HEADSEX	Gender of the household head
HEADAGE	Age of the household head
MSTATUS	Marital status of the household head

Appendix K- R codes for analyzing Life Insurance acquisition and dropping decisions using IHDS 2005 and 2011 datasets

#Read data files

data_2005<-read.csv(file="G:/PANEL DATA1/24-04-2017/20051.csv")

data_2011<-read.csv(file="G:/ /PANEL DATA1/24-04-2017/20111.csv")

#Merge 2005 and 2011 datasets

merged_data<-merge(data_2005,data_2011, by=c("UID"))

#Create variables using 2005 and 2011 data sets

merged_data$LIFE11<- 0

merged_data$LIFE11[(merged_data$LIFEP11==1) | (merged_data$LIFG11==1)]<-1

merged_data$HEALTH11<- 0

merged_data$HEALTH11[(merged_data$HEALTHG11==1) | (merged_data$HEALTHP11==1)]<-1

merged_data$NCHILD11<- merged_data$NCHILDM11+merged_data$NCHILDF11

merged_data$HOME_LOAN05<- 0

merged_data$HOME_LOAN05[(merged_data$LOANP05==1)]<-1

merged_data$AUTO_LOAN05<- 0

merged_data$AUTO_LOAN05[(merged_data$LOANP05==6)]<-1

merged_data$BANK_LOAN05<- 0

merged_data$BANK_LOAN05[(merged_data$LOANS05==5)]<-1

merged_data$HOME_LOAN11<- 0

merged_data$HOME_LOAN11[(merged_data$LOANP11==1)]<-1

merged_data$BANK_LOAN11<- 0

merged_data$BANK_LOAN11[(merged_data$LOANS11==5)]<-1

merged_data$AUTO_LOAN11<- 0

merged_data$AUTO_LOAN11[(merged_data$LOANP11==7)|(merged_data$LOANP11==8)|(merged_data$LOANP11==9)]<-1

merged_data$NMARRIED<- 0

merged_data$NMARRIED[(merged_data$MSTATUS05==2)&(merged_data$MSTATUS11==1)]<-1

merged_data$WIDOWED<- 0

merged_data$WIDOWED[(merged_data$MSTATUS05==1)&(merged_data$MSTATUS11==3)]<-1

merged_data$NEW_CHILD<- 0

merged_data$NEW_CHILD[((merged_data$NCHILD11-merged_data$NCHILD05)>0)]<-1

merged_data$ACQUIRED<- 0

merged_data$ACQUIRED[(merged_data$LIFE05==0)&(merged_data$LIFE11==1)]<-1

merged_data$DROPPED<- 0

merged_data$DROPPED[(merged_data$LIFE05==1)&(merged_data$LIFE11==0)]<-1

merged_data$CONTINUE<- 0

merged_data$CONTINUE[(merged_data$LIFE05==1)&(merged_data$LIFE11==1)]<-1

merged_data$UNINSURED<- 0

merged_data$UNINSURED[(merged_data$LIFE05==0)&(merged_data$LIFE11==0)]<-1

merged_data$ACQUIRED_LAND<- 0

merged_data$ACQUIRED_LAND[(merged_data$LAND_HOLDING05==0)&(merged_data$LAND_HOLDING11==1)]<-1

merged_data$SOLD_LAND<- 0

merged_data$SOLD_LAND[(merged_data$LAND_HOLDING05==1)&(merged_data$LAND_HOLDING11==0)]<-1

merged_data$ACQUIRED_CAR<- 0

merged_data$ACQUIRED_CAR[(merged_data$CAR05==0)&(merged_data$CAR11==1)]<-1

merged_data$SOLD_CAR<- 0

merged_data$SOLD_CAR[(merged_data$CAR05==1)&(merged_data$CAR11==0)]<-1

merged_data$ACQUIRED_MOTOR<- 0

merged_data$ACQUIRED_MOTOR[(merged_data$MOTOR_CYCLE05==0)&(merged_data$MOTOR_CYCLE11==1)]<-1

merged_data$SOLD_MOTOR<- 0

merged_data$SOLD_MOTOR[(merged_data$MOTOR_CYCLE05==1)&(merged_data$MOTOR_CYCLE11==0)]<-1

merged_data$BPL11<- merged_data$RATION_CARD11

merged_data$BPL05<- 0

merged_data$BPL05[(merged_data$RATION_CARD05==1)]<-1

#M_CONSUMPTION: Monthly per capita consumption

merged_data$CONSUMPTION05<-(merged_data$M_CONSUMPTION05)*(merged_data$NPERSONS05)*12

merged_data$CHANGE_IN_CONSUMPTION<- (merged_data$CONSUMPTION11-merged_data$CONSUMPTION05)

merged_data$CONSUMPTION_STATUS<-0

merged_data$CONSUMPTION_STATUS[(merged_data$CHANGE_IN_CONSUMPTION>0)]<-1

merged_data$CONSUMPTION_STATUS[(merged_data$CHANGE_IN_CONSUMPTION<0)]<-2

merged_data$CHANGE_IN_INCOME<- (merged_data$INCOME11-merged_data$INCOME05)

```
merged_data$PER_C_INCOME<-
(merged_data$CHANGE_IN_INCOME)/(merged_data$INCOME05)

merged_data$INCOME_STATUS<-0

merged_data$INCOME_STATUS[(merged_data$CHANGE_IN_INCOME>0)]<-1

merged_data$INCOME_STATUS[(merged_data$CHANGE_IN_INCOME<0)]<-2

merged_data$ACQUIRED_BPL<- 0

merged_data$ACQUIRED_BPL[(merged_data$BPL05==0)&(merged_data$BPL11==1)]<-1

merged_data$DROPPED_BPL<- 0

merged_data$DROPPED_BPL[(merged_data$BPL05==1)&(merged_data$BPL11==0)]<-1

merged_data$ACQUIRED_HEALTH<- 0

merged_data$ACQUIRED_HEALTH[(merged_data$HEALTH05==0)&(merged_data$HEAL
TH11==1)]<-1

merged_data$DROPPED_HEALTH<- 0

merged_data$DROPPED_HEALTH[(merged_data$HEALTH05==1)&(merged_data$HEALT
H11==0)]<-1

merged_data$ACQUIRED_HOME_LOAN<- 0

merged_data$ACQUIRED_HOME_LOAN[(merged_data$HOME_LOAN05==0)&(merged_d
ata$HOME_LOAN11==1)]<-1

merged_data$DROPPED_HOME_LOAN<- 0

merged_data$DROPPED_HOME_LOAN[(merged_data$HOME_LOAN05==1)&(merged_dat
a$HOME_LOAN11==0)]<-1

merged_data$ACQUIRED_AUTO_LOAN<- 0

merged_data$ACQUIRED_AUTO_LOAN[(merged_data$AUTO_LOAN05==0)&(merged_da
ta$AUTO_LOAN11==1)]<-1

merged_data$DROPPED_AUTO_LOAN<- 0

merged_data$DROPPED_AUTO_LOAN[(merged_data$AUTO_LOAN05==1)&(merged_data
$AUTO_LOAN11==0)]<-1

merged_data$ACQUIRED_BANK_LOAN<- 0

merged_data$ACQUIRED_BANK_LOAN[(merged_data$BANK_LOAN05==0)&(merged_da
ta$BANK_LOAN11==1)]<-1

merged_data$DROPPED_BANK_LOAN<- 0

merged_data$DROPPED_BANK_LOAN[(merged_data$BANK_LOAN05==1)&(merged_dat
a$BANK_LOAN11==0)]<-1

merged_data$ACQUIRED_BANK_AC<- 0

merged_data$ACQUIRED_BANK_AC[(merged_data$BANK_AC05==0)&(merged_data$BA
NK_AC11==1)]<-1

merged_data$CLOSED_BANK_AC<- 0

merged_data$CLOSED_BANK_AC[(merged_data$BANK_AC05==1)&(merged_data$BANK
_AC11==0)]<-1

merged_data$CHANGE_IN_AGE<- (merged_data$HEADAGE11-
merged_data$HEAD_AGE05)
```

merged_data$HEAD_CHANGED<- 0

merged_data$HEAD_CHANGED[(merged_data$HEAD_SEX05!=merged_data$HEADSEX11)]<-1

#Poverty Line: monthly per capita consumption expenditure of Rs.972 in rural areas and Rs.1,407 in urban areas in 2011-12 [http://pib.nic.in/newsite/PrintRelease.aspx?relid=108291]

merged_data$POOR<- 0

merged_data$POOR[(merged_data$URBAN11==0)&(0.0833333*(merged_data$CONSUMPTION11)/(merged_data$NPERSONS11)<972)]<-1

merged_data$POOR[(merged_data$URBAN11==1)&(0.0833333*(merged_data$CONSUMPTION11)/(merged_data$NPERSONS11)<1407)]<-1

#Define SEC Variables

merged_data$GAS_STOVE05<- 0

merged_data$GAS_STOVE05[(merged_data$LPG05==1) | (merged_data$LPG05==4)]<-1

merged_data$GAS_STOVE11<- 0

merged_data$GAS_STOVE11[(merged_data$LPG11==2) | (merged_data$LPG11==5)]<-1

merged_data$LAND_AG05<- 0

merged_data$LAND_AG05[(merged_data$AG_LAND05>1)]<-1

merged_data$LAND_AG11<- 0

merged_data$LAND_AG11[(merged_data$AG_LAND11>1)]<-1

#Count of durable mentioned in SEC list

merged_data$DURABLES05<-
(merged_data$ELECTRICITY05+merged_data$ELECTRIC_FAN05+merged_data$GAS_STOVE05+merged_data$MOTOR_CYCLE05+merged_data$COLOR_TV05+merged_data$REFRIGERATOR05+merged_data$WASHING_MACHINE05+merged_data$COMPUTER05+merged_data$CAR05+merged_data$AC05+merged_data$LAND_AG05)

merged_data$DURABLES11<-
(merged_data$ELECTRICITY11+merged_data$ELECTRIC_FAN11+merged_data$GAS_STOVE11+merged_data$MOTOR_CYCLE11+merged_data$COLOR_TV11+merged_data$REFRIGERATOR11+merged_data$WASHING_MACHINE11+merged_data$COMPUTER11+merged_data$CAR11+merged_data$AC11+merged_data$LAND_AG11)

#Create SEC variable 2005

merged_data$SEC05<-0

#Household head with a Professional degree

merged_data$SEC05[(merged_data$DEGREE.x==3)&(merged_data$HEAD_EDUCATION05>12)&(merged_data$DURABLES05>=9)]<-12

merged_data$SEC05[(merged_data$DEGREE.x==3)&(merged_data$HEAD_EDUCATION05>12)&(merged_data$DURABLES05==8)]<-11

merged_data$SEC05[(merged_data$DEGREE.x==3)&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==7)]<-11

merged_data$SEC05[(merged_data$DEGREE.x==3)&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==6)]<-10

merged_data$SEC05[(merged_data$DEGREE.x==3)&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==5)]<-9

merged_data$SEC05[(merged_data$DEGREE.x==3)&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==4)]<-8

merged_data$SEC05[(merged_data$DEGREE.x==3)&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==3)]<-6

merged_data$SEC05[(merged_data$DEGREE.x==3)&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==2)]<-5

merged_data$SEC05[(merged_data$DEGREE.x==3)&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==1)]<-4

merged_data$SEC05[(merged_data$DEGREE.x==3)&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==0)]<-4

#Household head with a Master degree

merged_data$SEC05 [(merged_data$DEGREE.x ==2)&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05>=9)]<-12

merged_data$SEC05 [(merged_data$DEGREE.x ==2)&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==8)]<-11

merged_data$SEC05 [(merged_data$DEGREE.x ==2)&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==7)]<-11

merged_data$SEC05 [(merged_data$DEGREE.x ==2)&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==6)]<-10

merged_data$SEC05 [(merged_data$DEGREE.x ==2)&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==5)]<-9

merged_data$SEC05 [(merged_data$DEGREE.x ==2)&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==4)]<-8

merged_data$SEC05 [(merged_data$DEGREE.x ==2)&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==3)]<-6

merged_data$SEC05 [(merged_data$DEGREE.x ==2)&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==2)]<-5

merged_data$SEC05 [(merged_data$DEGREE.x ==2)&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==1)]<-4

merged_data$SEC05 [(merged_data$DEGREE.x ==2)&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==0)]<-3

#Household head with a Bachelor's degree

merged_data$SEC05 [(merged_data$DEGREE.x ==1)&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05>=9)]<-12

merged_data$SEC05 [(merged_data$DEGREE.x ==1)&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==8)]<-11

merged_data$SEC05 [(merged_data$DEGREE.x
==1)&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==7)]<-11

merged_data$SEC05 [(merged_data$DEGREE.x
==1)&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==6)]<-10

merged_data$SEC05 [(merged_data$DEGREE.x
==1)&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==5)]<-9

merged_data$SEC05 [(merged_data$DEGREE.x
==1)&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==4)]<-8

merged_data$SEC05 [(merged_data$DEGREE.x
==1)&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==3)]<-6

merged_data$SEC05 [(merged_data$DEGREE.x
==1)&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==2)]<-5

merged_data$SEC05 [(merged_data$DEGREE.x
==1)&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==1)]<-4

merged_data$SEC05 [(merged_data$DEGREE.x
==1)&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==0)]<-3

#Household head with incomplete degree or a diploma

merged_data$SEC05 [(merged_data$DEGREE.x ==0)
&(merged_data$HEAD_EDUCATION05>12)&(merged_data$DURABLES05>=9)]<-11

merged_data$SEC05 [(merged_data$DEGREE.x ==0)
&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==8)]<-11

merged_data$SEC05 [(merged_data$DEGREE.x ==0)
&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==7)]<-10

merged_data$SEC05 [(merged_data$DEGREE.x ==0)
&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==6)]<-10

merged_data$SEC05 [(merged_data$DEGREE.x ==0)
&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==5)]<-9

merged_data$SEC05 [(merged_data$DEGREE.x ==0)
&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==4)]<-7

merged_data$SEC05 [(merged_data$DEGREE.x ==0)
&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==3)]<-6

merged_data$SEC05 [(merged_data$DEGREE.x ==0)
&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==2)]<-5

merged_data$SEC05 [(merged_data$DEGREE.x ==0)
&(merged_data$HEAD_EDUCATION05>12)&(merged_data$DURABLES05==1)]<-4

merged_data$SEC05 [(merged_data$DEGREE.x ==0)
&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==0)]<-2

#Household head with incomplete degree or a diploma

merged_data$SEC05 [is.na(merged_data$DEGREE.x
)&(merged_data$HEAD_EDUCATION05>12)&(merged_data$DURABLES05>=9)]<-11

merged_data$SEC05 [is.na(merged_data$DEGREE.x
)&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==8)]<-11

merged_data$SEC05 [is.na(merged_data$DEGREE.x
)&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==7)]<-10

merged_data$SEC05 [is.na(merged_data$DEGREE.x
)&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==6)]<-10

merged_data$SEC05 [is.na(merged_data$DEGREE.x
)&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==5)]<-9

merged_data$SEC05 [is.na(merged_data$DEGREE.x
)&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==4)]<-7

merged_data$SEC05 [is.na(merged_data$DEGREE.x
)&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==3)]<-6

merged_data$SEC05 [is.na(merged_data$DEGREE.x
)&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==2)]<-5

merged_data$SEC05 [is.na(merged_data$DEGREE.x
)&(merged_data$HEAD_EDUCATION05>12)&(merged_data$DURABLES05==1)]<-4

merged_data$SEC05 [is.na(merged_data$DEGREE.x
)&(merged_data$HEAD_EDUCATION05>12)& (merged_data$DURABLES05==0)]<-2

#Household head with invalid educational details

merged_data$SEC05
[(merged_data$DEGREE.x>0)&(merged_data$HEAD_EDUCATION05<13)]<--1

#Household head with 9<Education<13

merged_data$SEC05[(merged_data$HEAD_EDUCATION05>9)&(merged_data$HEAD_EDUCATION05<13)&(merged_data$DURABLES05>=9)]<-11

merged_data$SEC05[(merged_data$HEAD_EDUCATION05>9)&(merged_data$HEAD_EDUCATION05<13)&(merged_data$DURABLES05==8)]<-10

merged_data$SEC05[(merged_data$HEAD_EDUCATION05>9)&(merged_data$HEAD_EDUCATION05<13)&(merged_data$DURABLES05==7)]<-10

merged_data$SEC05[(merged_data$HEAD_EDUCATION05>9)&(merged_data$HEAD_EDUCATION05<13)&(merged_data$DURABLES05==6)]<-9

merged_data$SEC05[(merged_data$HEAD_EDUCATION05>9)&(merged_data$HEAD_EDUCATION05<13)&(merged_data$DURABLES05==5)]<-8

merged_data$SEC05[(merged_data$HEAD_EDUCATION05>9)&(merged_data$HEAD_EDUCATION05<13)&(merged_data$DURABLES05==4)]<-7

merged_data$SEC05[(merged_data$HEAD_EDUCATION05>9)&(merged_data$HEAD_EDUCATION05<13)&(merged_data$DURABLES05==3)]<-5

merged_data$SEC05[(merged_data$HEAD_EDUCATION05>9)&(merged_data$HEAD_EDUCATION05<13)&(merged_data$DURABLES05==2)]<-4

merged_data$SEC05[(merged_data$HEAD_EDUCATION05>9)&(merged_data$HEAD_EDUCATION05<13)&(merged_data$DURABLES05==1)]<-3

merged_data$SEC05[(merged_data$HEAD_EDUCATION05>9)&(merged_data$HEAD_EDUCATION05<13)&(merged_data$DURABLES05==0)]<-2

#Household head with 4<Education<10

merged_data$SEC05[(merged_data$HEAD_EDUCATION05>4)&(merged_data$HEAD_EDUCATION05<10)&(merged_data$DURABLES05>=9)]<-10

```
merged_data$SEC05[(merged_data$HEAD_EDUCATION05>4)&(merged_data$HEAD_ED
UCATION05<10)&(merged_data$DURABLES05==8)]<-10
```

```
merged_data$SEC05[(merged_data$HEAD_EDUCATION05>4)&(merged_data$HEAD_ED
UCATION05<10)&(merged_data$DURABLES05==7)]<-9
```

```
merged_data$SEC05[(merged_data$HEAD_EDUCATION05>4)&(merged_data$HEAD_ED
UCATION05<10)&(merged_data$DURABLES05==6)]<-8
```

```
merged_data$SEC05[(merged_data$HEAD_EDUCATION05>4)&(merged_data$HEAD_ED
UCATION05<10)&(merged_data$DURABLES05==5)]<-7
```

```
merged_data$SEC05[(merged_data$HEAD_EDUCATION05>4)&(merged_data$HEAD_ED
UCATION05<10)&(merged_data$DURABLES05==4)]<-6
```

```
merged_data$SEC05[(merged_data$HEAD_EDUCATION05>4)&(merged_data$HEAD_ED
UCATION05<10)&(merged_data$DURABLES05==3)]<-5
```

```
merged_data$SEC05[(merged_data$HEAD_EDUCATION05>4)&(merged_data$HEAD_ED
UCATION05<10)&(merged_data$DURABLES05==2)]<-4
```

```
merged_data$SEC05[(merged_data$HEAD_EDUCATION05>4)&(merged_data$HEAD_ED
UCATION05<10)&(merged_data$DURABLES05==1)]<-3
```

```
merged_data$SEC05[(merged_data$HEAD_EDUCATION05>4)&(merged_data$HEAD_ED
UCATION05<10)&(merged_data$DURABLES05==0)]<-2
```

#Household head with 0<Education<5

```
merged_data$SEC05[(merged_data$HEAD_EDUCATION05>0)&(merged_data$HEAD_ED
UCATION05<5)&(merged_data$DURABLES05>=9)]<-10
```

```
merged_data$SEC05[(merged_data$HEAD_EDUCATION05>0)&(merged_data$HEAD_ED
UCATION05<5)&(merged_data$DURABLES05==8)]<-10
```

```
merged_data$SEC05[(merged_data$HEAD_EDUCATION05>0)&(merged_data$HEAD_ED
UCATION05<5)&(merged_data$DURABLES05==7)]<-9
```

```
merged_data$SEC05[(merged_data$HEAD_EDUCATION05>0)&(merged_data$HEAD_ED
UCATION05<5)&(merged_data$DURABLES05==6)]<-8
```

```
merged_data$SEC05[(merged_data$HEAD_EDUCATION05>0)&(merged_data$HEAD_ED
UCATION05<5)&(merged_data$DURABLES05==5)]<-7
```

```
merged_data$SEC05[(merged_data$HEAD_EDUCATION05>0)&(merged_data$HEAD_ED
UCATION05<5)&(merged_data$DURABLES05==4)]<-6
```

```
merged_data$SEC05[(merged_data$HEAD_EDUCATION05>0)&(merged_data$HEAD_ED
UCATION05<5)&(merged_data$DURABLES05==3)]<-4
```

```
merged_data$SEC05[(merged_data$HEAD_EDUCATION05>0)&(merged_data$HEAD_ED
UCATION05<5)&(merged_data$DURABLES05==2)]<-3
```

```
merged_data$SEC05[(merged_data$HEAD_EDUCATION05>0)&(merged_data$HEAD_ED
UCATION05<5)&(merged_data$DURABLES05==1)]<-3
```

```
merged_data$SEC05[(merged_data$HEAD_EDUCATION05>0)&(merged_data$HEAD_ED
UCATION05<5)&(merged_data$DURABLES05==0)]<-2
```

#Household head without any formal Education

```
merged_data$SEC05[(merged_data$HEAD_EDUCATION05==0)&(merged_data$DURABLE
S05>=9)]<-9
```

```
merged_data$SEC05[(merged_data$HEAD_EDUCATION05==0)&(merged_data$DURABLE
S05==8)]<-9
```

merged_data$SEC05[(merged_data$HEAD_EDUCATION05==0)&(merged_data$DURABLES05==7)]<-7

merged_data$SEC05[(merged_data$HEAD_EDUCATION05==0)&(merged_data$DURABLES05==6)]<-7

merged_data$SEC05[(merged_data$HEAD_EDUCATION05==0)&(merged_data$DURABLES05==5)]<-6

merged_data$SEC05[(merged_data$HEAD_EDUCATION05==0)&(merged_data$DURABLES05==4)]<-5

merged_data$SEC05[(merged_data$HEAD_EDUCATION05==0)&(merged_data$DURABLES05==3)]<-4

merged_data$SEC05[(merged_data$HEAD_EDUCATION05==0)&(merged_data$DURABLES05==2)]<-3

merged_data$SEC05[(merged_data$HEAD_EDUCATION05==0)&(merged_data$DURABLES05==1)]<-2

merged_data$SEC05[(merged_data$HEAD_EDUCATION05==0)&(merged_data$DURABLES05==0)]<-1

#Take care of missing entries!!

merged_data$SEC05[is.na(merged_data$HEAD_EDUCATION05)]<-0

merged_data$SEC05[is.na(merged_data$DURABLES05)]<-0

#create SEC variable 2011

merged_data$SEC11<-0

#Household head with a Professional degree

merged_data$SEC11[(merged_data$DEGREE.y==3)&(merged_data$HEAD_EDUCATION11>12)&(merged_data$DURABLES11>=9)]<-12

merged_data$SEC11[(merged_data$DEGREE.y==3)&(merged_data$HEAD_EDUCATION11>12)&(merged_data$DURABLES11==8)]<-11

merged_data$SEC11[(merged_data$DEGREE.y==3)&(merged_data$HEAD_EDUCATION11>12)& (merged_data$DURABLES11==7)]<-11

merged_data$SEC11[(merged_data$DEGREE.y==3)&(merged_data$HEAD_EDUCATION11>12)& (merged_data$DURABLES11==6)]<-10

merged_data$SEC11[(merged_data$DEGREE.y==3)&(merged_data$HEAD_EDUCATION11>12)& (merged_data$DURABLES11==5)]<-9

merged_data$SEC11[(merged_data$DEGREE.y==3)&(merged_data$HEAD_EDUCATION11>12)& (merged_data$DURABLES11==4)]<-8

merged_data$SEC11[(merged_data$DEGREE.y==3)&(merged_data$HEAD_EDUCATION11>12)& (merged_data$DURABLES11==3)]<-6

merged_data$SEC11[(merged_data$DEGREE.y==3)&(merged_data$HEAD_EDUCATION11>12)& (merged_data$DURABLES11==2)]<-5

merged_data$SEC11[(merged_data$DEGREE.y==3)&(merged_data$HEAD_EDUCATION11>12)& (merged_data$DURABLES11==1)]<-4

merged_data$SEC11[(merged_data$DEGREE.y==3)&(merged_data$HEAD_EDUCATION11
>12)& (merged_data$DURABLES11==0)]<-4

#Household head with a Master degree

merged_data$SEC11[(merged_data$DEGREE.y==2)&(merged_data$HEAD_EDUCATION11
>12)& (merged_data$DURABLES11>=9)]<-12

merged_data$SEC11[(merged_data$DEGREE.y==2)&(merged_data$HEAD_EDUCATION11
>12)& (merged_data$DURABLES11==8)]<-11

merged_data$SEC11[(merged_data$DEGREE.y==2)&(merged_data$HEAD_EDUCATION11
>12)& (merged_data$DURABLES11==7)]<-11

merged_data$SEC11[(merged_data$DEGREE.y==2)&(merged_data$HEAD_EDUCATION11
>12)& (merged_data$DURABLES11==6)]<-10

merged_data$SEC11[(merged_data$DEGREE.y==2)&(merged_data$HEAD_EDUCATION11
>12)& (merged_data$DURABLES11==5)]<-9

merged_data$SEC11[(merged_data$DEGREE.y==2)&(merged_data$HEAD_EDUCATION11
>12)& (merged_data$DURABLES11==4)]<-8

merged_data$SEC11[(merged_data$DEGREE.y==2)&(merged_data$HEAD_EDUCATION11
>12)& (merged_data$DURABLES11==3)]<-6

merged_data$SEC11[(merged_data$DEGREE.y==2)&(merged_data$HEAD_EDUCATION11
>12)& (merged_data$DURABLES11==2)]<-5

merged_data$SEC11[(merged_data$DEGREE.y==2)&(merged_data$HEAD_EDUCATION11
>12)& (merged_data$DURABLES11==1)]<-4

merged_data$SEC11[(merged_data$DEGREE.y==2)&(merged_data$HEAD_EDUCATION11
>12)& (merged_data$DURABLES11==0)]<-3

#Household head with a Bachelor's degree

merged_data$SEC11[
(merged_data$DEGREE.y==1)&(merged_data$HEAD_EDUCATION11>12)&
(merged_data$DURABLES11>=9)]<-12

merged_data$SEC11[
(merged_data$DEGREE.y==1)&(merged_data$HEAD_EDUCATION11>12)&
(merged_data$DURABLES11==8)]<-11

merged_data$SEC11[
(merged_data$DEGREE.y==1)&(merged_data$HEAD_EDUCATION11>12)&
(merged_data$DURABLES11==7)]<-11

merged_data$SEC11[
(merged_data$DEGREE.y==1)&(merged_data$HEAD_EDUCATION11>12)&
(merged_data$DURABLES11==6)]<-10

merged_data$SEC11[
(merged_data$DEGREE.y==1)&(merged_data$HEAD_EDUCATION11>12)&
(merged_data$DURABLES11==5)]<-9

merged_data$SEC11[
(merged_data$DEGREE.y==1)&(merged_data$HEAD_EDUCATION11>12)&
(merged_data$DURABLES11==4)]<-8

merged_data$SEC11[
(merged_data$DEGREE.y==1)&(merged_data$HEAD_EDUCATION11>12)&
(merged_data$DURABLES11==3)]<-6

merged_data$SEC11[
(merged_data$DEGREE.y==1)&(merged_data$HEAD_EDUCATION11>12)&
(merged_data$DURABLES11==2)]<-5

merged_data$SEC11[
(merged_data$DEGREE.y==1)&(merged_data$HEAD_EDUCATION11>12)&
(merged_data$DURABLES11==1)]<-4

merged_data$SEC11[
(merged_data$DEGREE.y==1)&(merged_data$HEAD_EDUCATION11>12)&
(merged_data$DURABLES11==0)]<-3

#Household head with incomplete degree or a diploma

merged_data$SEC11[(merged_data$DEGREE.y==0)&(merged_data$HEAD_EDUCATION11
>12)&(merged_data$DURABLES11>=9)]<-11

merged_data$SEC11[(merged_data$DEGREE.y==0)&(merged_data$HEAD_EDUCATION11
>12)& (merged_data$DURABLES11==8)]<-11

merged_data$SEC11[(merged_data$DEGREE.y==0)&(merged_data$HEAD_EDUCATION11
>12)& (merged_data$DURABLES11==7)]<-10

merged_data$SEC11[(merged_data$DEGREE.y==0)&(merged_data$HEAD_EDUCATION11
>12)& (merged_data$DURABLES11==6)]<-10

merged_data$SEC11[(merged_data$DEGREE.y==0)&(merged_data$HEAD_EDUCATION11
>12)& (merged_data$DURABLES11==5)]<-9

merged_data$SEC11[(merged_data$DEGREE.y==0)&(merged_data$HEAD_EDUCATION11
>12)& (merged_data$DURABLES11==4)]<-7

merged_data$SEC11[(merged_data$DEGREE.y==0)&(merged_data$HEAD_EDUCATION11
>12)& (merged_data$DURABLES11==3)]<-6

merged_data$SEC11[(merged_data$DEGREE.y==0)&(merged_data$HEAD_EDUCATION11
>12)& (merged_data$DURABLES11==2)]<-5

merged_data$SEC11[(merged_data$DEGREE.y==0)&(merged_data$HEAD_EDUCATION11
>12)&(merged_data$DURABLES11==1)]<-4

merged_data$SEC11[(merged_data$DEGREE.y==0)&(merged_data$HEAD_EDUCATION11
>12)& (merged_data$DURABLES11==0)]<-2

#Household head with incomplete degree or a diploma

merged_data$SEC11[
is.na(merged_data$DEGREE.y)&(merged_data$HEAD_EDUCATION11>12)&(merged_data
$DURABLES11>=9)]<-11

merged_data$SEC11[
is.na(merged_data$DEGREE.y)&(merged_data$HEAD_EDUCATION11>12)&
(merged_data$DURABLES11==8)]<-11

merged_data$SEC11[
is.na(merged_data$DEGREE.y)&(merged_data$HEAD_EDUCATION11>12)&
(merged_data$DURABLES11==7)]<-10

merged_data$SEC11[
is.na(merged_data$DEGREE.y)&(merged_data$HEAD_EDUCATION11>12)&
(merged_data$DURABLES11==6)]<-10

merged_data$SEC11[
is.na(merged_data$DEGREE.y)&(merged_data$HEAD_EDUCATION11>12)&
(merged_data$DURABLES11==5)]<-9

merged_data$SEC11[
is.na(merged_data$DEGREE.y)&(merged_data$HEAD_EDUCATION11>12)&
(merged_data$DURABLES11==4)]<-7

merged_data$SEC11[
is.na(merged_data$DEGREE.y)&(merged_data$HEAD_EDUCATION11>12)&
(merged_data$DURABLES11==3)]<-6

merged_data$SEC11[
is.na(merged_data$DEGREE.y)&(merged_data$HEAD_EDUCATION11>12)&
(merged_data$DURABLES11==2)]<-5

merged_data$SEC11[
is.na(merged_data$DEGREE.y)&(merged_data$HEAD_EDUCATION11>12)&(merged_data
$DURABLES11==1)]<-4

merged_data$SEC11[
is.na(merged_data$DEGREE.y)&(merged_data$HEAD_EDUCATION11>12)&
(merged_data$DURABLES11==0)]<-2

#Household head with invalid educational details

merged_data$SEC11[(merged_data$DEGREE.y>0)
&(merged_data$HEAD_EDUCATION11<13)]<--1

#Household head with 9<Education<13

merged_data$SEC11[(merged_data$HEAD_EDUCATION11>9)&(merged_data$HEAD_ED
UCATION11<13)&(merged_data$DURABLES11>=9)]<-11

merged_data$SEC11[(merged_data$HEAD_EDUCATION11>9)&(merged_data$HEAD_ED
UCATION11<13)&(merged_data$DURABLES11==8)]<-10

merged_data$SEC11[(merged_data$HEAD_EDUCATION11>9)&(merged_data$HEAD_ED
UCATION11<13)&(merged_data$DURABLES11==7)]<-10

merged_data$SEC11[(merged_data$HEAD_EDUCATION11>9)&(merged_data$HEAD_ED
UCATION11<13)&(merged_data$DURABLES11==6)]<-9

merged_data$SEC11[(merged_data$HEAD_EDUCATION11>9)&(merged_data$HEAD_ED
UCATION11<13)&(merged_data$DURABLES11==5)]<-8

merged_data$SEC11[(merged_data$HEAD_EDUCATION11>9)&(merged_data$HEAD_ED
UCATION11<13)&(merged_data$DURABLES11==4)]<-7

merged_data$SEC11[(merged_data$HEAD_EDUCATION11>9)&(merged_data$HEAD_ED
UCATION11<13)&(merged_data$DURABLES11==3)]<-5

merged_data$SEC11[(merged_data$HEAD_EDUCATION11>9)&(merged_data$HEAD_ED
UCATION11<13)&(merged_data$DURABLES11==2)]<-4

merged_data$SEC11[(merged_data$HEAD_EDUCATION11>9)&(merged_data$HEAD_ED
UCATION11<13)&(merged_data$DURABLES11==1)]<-3

merged_data$SEC11[(merged_data$HEAD_EDUCATION11>9)&(merged_data$HEAD_ED
UCATION11<13)&(merged_data$DURABLES11==0)]<-2

#Household head with 4<Education<10

merged_data$SEC11[(merged_data$HEAD_EDUCATION11>4)&(merged_data$HEAD_ED
UCATION11<10)&(merged_data$DURABLES11>=9)]<-10

merged_data$SEC11[(merged_data$HEAD_EDUCATION11>4)&(merged_data$HEAD_ED
UCATION11<10)&(merged_data$DURABLES11==8)]<-10

merged_data$SEC11[(merged_data$HEAD_EDUCATION11>4)&(merged_data$HEAD_EDUCATION11<10)&(merged_data$DURABLES11==7)]<-9

merged_data$SEC11[(merged_data$HEAD_EDUCATION11>4)&(merged_data$HEAD_EDUCATION11<10)&(merged_data$DURABLES11==6)]<-8

merged_data$SEC11[(merged_data$HEAD_EDUCATION11>4)&(merged_data$HEAD_EDUCATION11<10)&(merged_data$DURABLES11==5)]<-7

merged_data$SEC11[(merged_data$HEAD_EDUCATION11>4)&(merged_data$HEAD_EDUCATION11<10)&(merged_data$DURABLES11==4)]<-6

merged_data$SEC11[(merged_data$HEAD_EDUCATION11>4)&(merged_data$HEAD_EDUCATION11<10)&(merged_data$DURABLES11==3)]<-5

merged_data$SEC11[(merged_data$HEAD_EDUCATION11>4)&(merged_data$HEAD_EDUCATION11<10)&(merged_data$DURABLES11==2)]<-4

merged_data$SEC11[(merged_data$HEAD_EDUCATION11>4)&(merged_data$HEAD_EDUCATION11<10)&(merged_data$DURABLES11==1)]<-3

merged_data$SEC11[(merged_data$HEAD_EDUCATION11>4)&(merged_data$HEAD_EDUCATION11<10)&(merged_data$DURABLES11==0)]<-2

#Household head with 0<Education<5

merged_data$SEC11[(merged_data$HEAD_EDUCATION11>0)&(merged_data$HEAD_EDUCATION11<5)&(merged_data$DURABLES11>=9)]<-10

merged_data$SEC11[(merged_data$HEAD_EDUCATION11>0)&(merged_data$HEAD_EDUCATION11<5)&(merged_data$DURABLES11==8)]<-10

merged_data$SEC11[(merged_data$HEAD_EDUCATION11>0)&(merged_data$HEAD_EDUCATION11<5)&(merged_data$DURABLES11==7)]<-9

merged_data$SEC11[(merged_data$HEAD_EDUCATION11>0)&(merged_data$HEAD_EDUCATION11<5)&(merged_data$DURABLES11==6)]<-8

merged_data$SEC11[(merged_data$HEAD_EDUCATION11>0)&(merged_data$HEAD_EDUCATION11<5)&(merged_data$DURABLES11==5)]<-7

merged_data$SEC11[(merged_data$HEAD_EDUCATION11>0)&(merged_data$HEAD_EDUCATION11<5)&(merged_data$DURABLES11==4)]<-6

merged_data$SEC11[(merged_data$HEAD_EDUCATION11>0)&(merged_data$HEAD_EDUCATION11<5)&(merged_data$DURABLES11==3)]<-4

merged_data$SEC11[(merged_data$HEAD_EDUCATION11>0)&(merged_data$HEAD_EDUCATION11<5)&(merged_data$DURABLES11==2)]<-3

merged_data$SEC11[(merged_data$HEAD_EDUCATION11>0)&(merged_data$HEAD_EDUCATION11<5)&(merged_data$DURABLES11==1)]<-3

merged_data$SEC11[(merged_data$HEAD_EDUCATION11>0)&(merged_data$HEAD_EDUCATION11<5)&(merged_data$DURABLES11==0)]<-2

#Household head without any formal Education

merged_data$SEC11[(merged_data$HEAD_EDUCATION11==0)&(merged_data$DURABLES11>=9)]<-9

merged_data$SEC11[(merged_data$HEAD_EDUCATION11==0)&(merged_data$DURABLES11==8)]<-9

merged_data$SEC11[(merged_data$HEAD_EDUCATION11==0)&(merged_data$DURABLES11==7)]<-7

merged_data$SEC11[(merged_data$HEAD_EDUCATION11==0)&(merged_data$DURABLES11==6)]<-7

merged_data$SEC11[(merged_data$HEAD_EDUCATION11==0)&(merged_data$DURABLES11==5)]<-6

merged_data$SEC11[(merged_data$HEAD_EDUCATION11==0)&(merged_data$DURABLES11==4)]<-5

merged_data$SEC11[(merged_data$HEAD_EDUCATION11==0)&(merged_data$DURABLES11==3)]<-4

merged_data$SEC11[(merged_data$HEAD_EDUCATION11==0)&(merged_data$DURABLES11==2)]<-3

merged_data$SEC11[(merged_data$HEAD_EDUCATION11==0)&(merged_data$DURABLES11==1)]<-2

merged_data$SEC11[(merged_data$HEAD_EDUCATION11==0)&(merged_data$DURABLES11==0)]<-1

#Take care of missing entries!!

merged_data$SEC11[is.na(merged_data$HEAD_EDUCATION11)]<-0

merged_data$SEC11[is.na(merged_data$DURABLES11)]<-0

#Track changes in SEC status during 2005 and 2011

merged_data$SEC_IMP<-0

merged_data$SEC_IMP[(merged_data$SEC11)>(merged_data$SEC05)]<-1

merged_data$SEC_IMP[(merged_data$SEC11)<(merged_data$SEC05)]<-2

#Remove variable with missing data

clean<-subset(merged_data,select = -
c(AG_LAND05,DEGREE.x,WASHING_MACHINE05,WASHING_MACHINE11,COMPUT
ER05,DEGREE.y,RATION_CARD05,CAR05,LOANP05,LOANS05,BANK_AC05,LOANP1
1,LOANS11))

clean_data1<-na.omit(clean)

#Final data for analysis (further cleaning)

clean_data<-subset(clean_data1,HEAD_AGE05>18 & HEADAGE11>18 & INCOME05>100
& INCOME11>100 & PER_C_INCOME<20)

#Create some more variables

clean_data$LN_INCOME05<-log(clean_data$INCOME05)

clean_data$LN_INCOME11<-log(clean_data$INCOME11)

```
clean_data$LN_INCOME05_SQUR<-
(clean_data$LN_INCOME05)*(clean_data$LN_INCOME05)

clean_data$LN_INCOME11_SQUR<-
(clean_data$LN_INCOME11)*(clean_data$LN_INCOME11)

clean_data$PER_C_INCOME<-
(clean_data$CHANGE_IN_INCOME)/(clean_data$INCOME05)

clean_data$FAMILY_SIZE_CHNG<-(clean_data$NPERSONS11-
clean_data$NPERSONS05)/(clean_data$NPERSONS05)
```

#Define Categorical variables
```
clean_data$URBAN11<-factor(clean_data$URBAN11)

clean_data$URBAN05<-factor(clean_data$URBAN05)

clean_data$HEADSEX11<-factor(clean_data$HEADSEX11)

clean_data$NMARRIED<-factor(clean_data$NMARRIED)

clean_data$WIDOWED<-factor(clean_data$WIDOWED)

clean_data$NEW_CHILD<-factor(clean_data$NEW_CHILD)

clean_data$BANK_AC11<-factor(clean_data$BANK_AC11)

clean_data$BANK_AC11<-factor(clean_data$BANK_AC11)

clean_data$BANK_LOAN11<-factor(clean_data$BANK_AC11)

clean_data$HEAD_CHANGED<-factor(clean_data$HEAD_CHANGED)

clean_data$POOR<-factor(clean_data$POOR)

clean_data$BPL05<-factor(clean_data$BPL05)

clean_data$BPL11<-factor(clean_data$BPL11)

clean_data$ACQUIRED_BPL<-factor(clean_data$ACQUIRED_BPL)

clean_data$ACQUIRED_BANK_AC<-factor(clean_data$ACQUIRED_BANK_AC)

clean_data$ACQUIRED_BANK_LOAN<-factor(clean_data$ACQUIRED_BANK_LOAN)

clean_data$SEC05<-factor(clean_data$SEC05)

clean_data$SEC11<-factor(clean_data$SEC11)

clean_data$SEC_IMP<-factor(clean_data$SEC_IMP)
```

#crate data set for analyzing life insurance acquisition
```
acquire_data<-subset(clean_data,LIFE05==0)
```

#Univariate regression models
```
aqr<-glm(ACQUIRED~LN_INCOME05,data=acquire_data,family = "binomial")

aqr<-glm(ACQUIRED~LN_INCOME11,data=acquire_data,family = "binomial")

aqr<-glm(ACQUIRED~LN_INCOME05_SQUR,data=acquire_data,family = "binomial")

aqr<-glm(ACQUIRED~LN_INCOME11_SQUR,data=acquire_data,family = "binomial")

aqr<-glm(ACQUIRED~PER_C_INCOME,data=acquire_data,family = "binomial")
```

```
aqr1<-glm(ACQUIRED~LN_INCOME11+LN_INCOME11_SQUR,data=acquire_data,family = "binomial")

aqr1<-glm(ACQUIRED~LN_INCOME11+PER_C_INCOME,data=acquire_data,family = "binomial")

aqr1<-glm(ACQUIRED~LN_INCOME11_SQUR+PER_C_INCOME,data=acquire_data,family = "binomial")

aqr1<-glm(ACQUIRED~LN_INCOME05+PER_C_INCOME,data=acquire_data,family = "binomial")

aqr1A<-glm(ACQUIRED~LN_INCOME05+PER_C_INCOME+LN_INCOME05*HEADSEX11+PER_C_INCOME*HEADSEX11,data=acquire_data,family = "binomial")

aqr2<-glm(ACQUIRED~HEADAGE11,data=acquire_data,family = "binomial")

aqr3<-glm(ACQUIRED~HEADSEX11,data=acquire_data,family = "binomial")

aqr3A<-glm(ACQUIRED~HEADSEX11+HEADSEX11*HEADAGE11,data=acquire_data,family = "binomial")

aqr4<-glm(ACQUIRED~NPERSONS11,data=acquire_data,family = "binomial")

aqr4A<-glm(ACQUIRED~NPERSONS05,data=acquire_data,family = "binomial")

aqr5<-glm(ACQUIRED~NCHILD11,data=acquire_data,family = "binomial")

aqr6<-glm(ACQUIRED~FAMILY_SIZE_CHNG,data=acquire_data,family = "binomial")


aqr7<-glm(ACQUIRED~POOR,data=acquire_data,family = "binomial")

aqr8<-glm(ACQUIRED~BPL05,data=acquire_data,family = "binomial")

aqr8<-glm(ACQUIRED~BPL11,data=acquire_data,family = "binomial")

aqr8<-glm(ACQUIRED~ACQUIRED_BPL,data=acquire_data,family = "binomial")

aqr9<-glm(ACQUIRED~ACQUIRED_BANK_AC,data=acquire_data,family = "binomial")

aqr10<-glm(ACQUIRED~ACQUIRED_BANK_LOAN,data=acquire_data,family = "binomial")

aqr11<-glm(ACQUIRED~URBAN11,data=acquire_data,family = "binomial")

aqr10A<-glm(ACQUIRED~POOR+ACQUIRED_BPL+ACQUIRED_BANK_AC+ACQUIRED_BANK_LOAN,data=acquire_data,family = "binomial")


aqr12<-glm(ACQUIRED~HEAD_EDUCATION11,data=acquire_data,family = "binomial")

aqr12A<-glm(ACQUIRED~HEAD_EDUCATION11+HEAD_EDUCATION11*HEADSEX11,data=acquire_data,family = "binomial")

aqr13<-glm(ACQUIRED~NMARRIED,data=acquire_data,family = "binomial")

aqr14<-glm(ACQUIRED~NEW_CHILD,data=acquire_data,family = "binomial")

aqr15<-glm(ACQUIRED~WIDOWED,data=acquire_data,family = "binomial")
```

```
aqr15A<-
glm(ACQUIRED~HEADSEX11+HEADAGE11+HEADSEX11*HEADAGE11+NPERSONS1
1+FAMILY_SIZE_CHNG+URBAN11+HEAD_EDUCATION11+HEAD_EDUCATION11*
HEADSEX11+NMARRIED+NEW_CHILD+WIDOWED,data=acquire_data,family =
"binomial")

aqr15B<-
glm(ACQUIRED~HEADSEX11+NPERSONS11+FAMILY_SIZE_CHNG+URBAN11+WID
OWED,data=acquire_data,family = "binomial")


aqr16<-glm(ACQUIRED~SEC05,data=acquire_data,family = "binomial")

aqr17<-glm(ACQUIRED~SEC11,data=acquire_data,family = "binomial")

aqr18<-glm(ACQUIRED~SEC_IMP,data=acquire_data,family = "binomial")

aqr18A<-glm(ACQUIRED~SEC05+SEC_IMP,data=acquire_data,family = "binomial")
```

#Category wise backward regression models

```
aqr19<-
glm(ACQUIRED~LN_INCOME05+PER_C_INCOME+LN_INCOME05*HEADSEX11+PER
_C_INCOME*HEADSEX11+HEADAGE11+HEADSEX11+FAMILY_SIZE_CHNG+URBA
N11+HEAD_EDUCATION11+NMARRIED+NEW_CHILD+WIDOWED+POOR+ACQUIR
ED_BPL+ACQUIRED_BANK_AC+ACQUIRED_BANK_LOAN+SEC05+SEC_IMP,data=ac
quire_data,family = "binomial")

aqr19A<-
glm(ACQUIRED~HEADAGE11+HEADSEX11+FAMILY_SIZE_CHNG+URBAN11+HEAD
_EDUCATION11+NMARRIED+NEW_CHILD+WIDOWED+POOR+ACQUIRED_BPL+A
CQUIRED_BANK_AC+ACQUIRED_BANK_LOAN+SEC05+SEC_IMP,data=acquire_data,f
amily = "binomial")

aqr19B<-
glm(ACQUIRED~LN_INCOME05+PER_C_INCOME+LN_INCOME05*HEADSEX11+PER
_C_INCOME*HEADSEX11+POOR+ACQUIRED_BPL+ACQUIRED_BANK_AC+ACQUI
RED_BANK_LOAN+SEC05+SEC_IMP,data=acquire_data,family = "binomial")

aqr19C<-
glm(ACQUIRED~LN_INCOME05+PER_C_INCOME+LN_INCOME05*HEADSEX11+PER
_C_INCOME*HEADSEX11+HEADAGE11+HEADSEX11+FAMILY_SIZE_CHNG+URBA
N11+HEAD_EDUCATION11+NMARRIED+NEW_CHILD+WIDOWED+ACQUIRED_BA
NK_AC+ACQUIRED_BANK_LOAN+SEC05+SEC_IMP,data=acquire_data,family =
"binomial")

aqr19D<-
glm(ACQUIRED~LN_INCOME05+PER_C_INCOME+LN_INCOME05*HEADSEX11+PER
_C_INCOME*HEADSEX11+HEADAGE11+HEADSEX11+FAMILY_SIZE_CHNG+URBA
N11+HEAD_EDUCATION11+NMARRIED+NEW_CHILD+WIDOWED+POOR+ACQUIR
ED_BPL+SEC05+SEC_IMP,data=acquire_data,family = "binomial")

aqr19E<-
glm(ACQUIRED~LN_INCOME05+PER_C_INCOME+LN_INCOME05*HEADSEX11+PER
_C_INCOME*HEADSEX11+HEADAGE11+HEADSEX11+FAMILY_SIZE_CHNG+URBA
N11+HEAD_EDUCATION11+NMARRIED+NEW_CHILD+WIDOWED+POOR+ACQUIR
ED_BPL+ACQUIRED_BANK_AC+ACQUIRED_BANK_LOAN,data=acquire_data,family =
"binomial")
```

#Crate data set for analyzing life insurance termination

drop_data<-subset(clean_data,LIFE05==1)

#Catagory wise backward regression models

drop<-
glm(DROPPED~LN_INCOME05+PER_C_INCOME+LN_INCOME05*HEADSEX11+PER_
C_INCOME*HEADSEX11+HEADAGE11+HEADSEX11+FAMILY_SIZE_CHNG+URBAN
11+HEAD_EDUCATION11+NMARRIED+NEW_CHILD+WIDOWED+POOR+ACQUIRE
D_BPL+ACQUIRED_BANK_AC+ACQUIRED_BANK_LOAN+SEC05+SEC_IMP,data=dro
p_data,family = "binomial")

drop1<-
glm(DROPPED~LN_INCOME05+PER_C_INCOME+HEADAGE11+HEADSEX11+FAMIL
Y_SIZE_CHNG+URBAN11+HEAD_EDUCATION11+NMARRIED+NEW_CHILD+WIDO
WED+POOR+ACQUIRED_BPL+ACQUIRED_BANK_AC+ACQUIRED_BANK_LOAN+S
EC05+SEC_IMP,data=drop_data,family = "binomial")

drop2<-
glm(DROPPED~HEADAGE11+HEADSEX11+FAMILY_SIZE_CHNG+URBAN11+HEAD_
EDUCATION11+NMARRIED+NEW_CHILD+WIDOWED+POOR+ACQUIRED_BPL+AC
QUIRED_BANK_AC+ACQUIRED_BANK_LOAN+SEC05+SEC_IMP,data=drop_data,famil
y = "binomial")

drop3<-
glm(DROPPED~LN_INCOME05+PER_C_INCOME+POOR+ACQUIRED_BPL+ACQUIRE
D_BANK_AC+ACQUIRED_BANK_LOAN+SEC05+SEC_IMP,data=drop_data,family =
"binomial")

drop4<-
glm(DROPPED~LN_INCOME05+PER_C_INCOME+HEADAGE11+HEADSEX11+FAMIL
Y_SIZE_CHNG+URBAN11+HEAD_EDUCATION11+NMARRIED+NEW_CHILD+WIDO
WED+ACQUIRED_BANK_AC+ACQUIRED_BANK_LOAN+SEC05+SEC_IMP,data=drop
_data,family = "binomial")

drop5<-
glm(DROPPED~LN_INCOME05+PER_C_INCOME+HEADAGE11+HEADSEX11+FAMIL
Y_SIZE_CHNG+URBAN11+HEAD_EDUCATION11+NMARRIED+NEW_CHILD+WIDO
WED+POOR+ACQUIRED_BPL+SEC05+SEC_IMP,data=drop_data,family = "binomial")

drop6<-
glm(DROPPED~LN_INCOME05+PER_C_INCOME+HEADAGE11+HEADSEX11+FAMIL
Y_SIZE_CHNG+URBAN11+HEAD_EDUCATION11+NMARRIED+NEW_CHILD+WIDO
WED+POOR+ACQUIRED_BPL+ACQUIRED_BANK_AC+ACQUIRED_BANK_LOAN,dat
a=drop_data,family = "binomial")

#Crate data set for analyzing life insurance acquisition (RURAL_MODEL)

acquire_data_r<-subset(clean_data,LIFE05==0 & URBAN11==0)

#Rural acquire models

aqrr<-
glm(ACQUIRED~LN_INCOME05+PER_C_INCOME+LN_INCOME05*HEADSEX11+PER
_C_INCOME*HEADSEX11+HEADAGE11+HEADSEX11+FAMILY_SIZE_CHNG+HEAD
_EDUCATION11+NMARRIED+NEW_CHILD+WIDOWED+POOR+ACQUIRED_BPL+A

CQUIRED_BANK_AC+ACQUIRED_BANK_LOAN+SEC05+SEC_IMP,data=acquire_data_r,family = "binomial")

aqrr1<-
glm(ACQUIRED~LN_INCOME05+PER_C_INCOME+HEADAGE11+HEADSEX11+FAMILY_SIZE_CHNG+HEAD_EDUCATION11+NMARRIED+NEW_CHILD+WIDOWED+POOR+ACQUIRED_BPL+ACQUIRED_BANK_AC+ACQUIRED_BANK_LOAN+SEC05+SEC_IMP,data=acquire_data_r,family = "binomial")

#Crate data set for analyzing life insurance acquisition (URBAN_MODEL)

acquire_data_u<-subset(clean_data,LIFE05==0 & URBAN11==1)

#Urban acquire models

aqru<-
glm(ACQUIRED~LN_INCOME05+PER_C_INCOME+LN_INCOME05*HEADSEX11+PER_C_INCOME*HEADSEX11+HEADAGE11+HEADSEX11+FAMILY_SIZE_CHNG+HEAD_EDUCATION11+NMARRIED+NEW_CHILD+WIDOWED+POOR+ACQUIRED_BPL+ACQUIRED_BANK_AC+ACQUIRED_BANK_LOAN+SEC05+SEC_IMP,data=acquire_data_u,family = "binomial")

aqru1<-
glm(ACQUIRED~LN_INCOME05+PER_C_INCOME+HEADAGE11+HEADSEX11+FAMILY_SIZE_CHNG+HEAD_EDUCATION11+NMARRIED+NEW_CHILD+WIDOWED+POOR+ACQUIRED_BPL+ACQUIRED_BANK_AC+ACQUIRED_BANK_LOAN+SEC05+SEC_IMP,data=acquire_data_u,family = "binomial")

#Crate data set for analyzing life insurance termination (RURAL_MODEL)

drop_data_r<-subset(clean_data,LIFE05==1 & URBAN11==0)

#Rural dropp models

dropr<-
glm(DROPPED~LN_INCOME05+PER_C_INCOME+LN_INCOME05*HEADSEX11+PER_C_INCOME*HEADSEX11+HEADAGE11+HEADSEX11+FAMILY_SIZE_CHNG+HEAD_EDUCATION11+NMARRIED+NEW_CHILD+WIDOWED+POOR+ACQUIRED_BPL+ACQUIRED_BANK_AC+ACQUIRED_BANK_LOAN+SEC05+SEC_IMP,data=drop_data_r,family = "binomial")

dropr1<-
glm(DROPPED~LN_INCOME05+PER_C_INCOME+HEADAGE11+HEADSEX11+FAMILY_SIZE_CHNG+HEAD_EDUCATION11+NMARRIED+NEW_CHILD+WIDOWED+POOR+ACQUIRED_BPL+ACQUIRED_BANK_AC+ACQUIRED_BANK_LOAN+SEC05+SEC_IMP,data=drop_data_r,family = "binomial")

#Crate data set for analyzing life insurance termination (URBAN_MODEL)

drop_data_u<-subset(clean_data,LIFE05==1 & URBAN11==1)

#Urban dropp models

dropu<-
glm(DROPPED~LN_INCOME05+PER_C_INCOME+LN_INCOME05*HEADSEX11+PER_
C_INCOME*HEADSEX11+HEADAGE11+HEADSEX11+FAMILY_SIZE_CHNG+HEAD_
EDUCATION11+NMARRIED+NEW_CHILD+WIDOWED+POOR+ACQUIRED_BPL+AC
QUIRED_BANK_AC+ACQUIRED_BANK_LOAN+SEC05+SEC_IMP,data=drop_data_u,fa
mily = "binomial")

dropu1<-glm
(DROPPED~LN_INCOME05+PER_C_INCOME+HEADAGE11+HEADSEX11+FAMILY_S
IZE_CHNG+HEAD_EDUCATION11+NMARRIED+NEW_CHILD+WIDOWED+POOR+A
CQUIRED_BPL+ACQUIRED_BANK_AC+ACQUIRED_BANK_LOAN+SEC05+SEC_IMP,
data=drop_data_u,family = "binomial")

Appendix L- R codes for analyzing Premium expenditure using IHDS 2005 and 2011 datasets

#Create data for Premium Expenditure Models

premium_data<-subset(clean_data, LIFE11==1 & PREMIUM>2)

premium_data$LN_CONSUMPTION11<- log(premium_data$CONSUMPTION11)

premium_data$LN_PREMIUM<- log(premium_data$PREMIUM)

#Create variable for marital status

premium_data$MARITAL_STATUS[(premium_data$MSTATUS11==0)]<-3

premium_data$MARITAL_STATUS[(premium_data$MSTATUS11==1)]<-0

premium_data$MARITAL_STATUS[(premium_data$MSTATUS11==2)]<-1

premium_data$MARITAL_STATUS[(premium_data$MSTATUS11==3)]<-2

premium_data$MARITAL_STATUS[(premium_data$MSTATUS11==4)]<-3

#Define categorical variables

premium_data$HEADSEX11<-factor(premium_data$HEADSEX11)

premium_data$MARITAL_STATUS<-factor(premium_data$MARITAL_STATUS)

premium_data$POOR<-factor(premium_data$POOR)

premium_data$BANK_LOAN11<-factor(premium_data$BANK_LOAN11)

premium_data$BANK_AC11<-factor(premium_data$BANK_AC11)

#Premium expenditure model

cover<-
lm(LN_PREMIUM~POOR+BPL11+LN_INCOME11+SEC+SEC_IMP+PER_C_INCOME+A
CQUIRED_BANK_AC+ACQUIRED_BANK_LOAN+HEADSEX11+HEADAGE11+FAMIL
Y_SIZE_CHNG+NMARRIED+NEW_CHILD+WIDOWED+POOR*PER_C_INCOME,data=
premium_data)

#Create data for rural urban models

premium_data_r<-subset(premium_data,URBAN11==0)

premium_data_u<-subset(premium_data,URBAN11==1)

#Premium expenditure models- rural and urban

cover1r<-
lm(LN_PREMIUM~POOR+BPL11+LN_INCOME11+SEC+SEC_IMP+PER_C_INCOME+A
CQUIRED_BANK_AC+ACQUIRED_BANK_LOAN+HEADSEX11+HEADAGE11+FAMIL
Y_SIZE_CHNG+NMARRIED+NEW_CHILD+WIDOWED+POOR*PER_C_INCOME,data=
premium_data_r)

cover1u<-
lm(LN_PREMIUM~POOR+BPL11+LN_INCOME11+SEC+SEC_IMP+PER_C_INCOME+A

CQUIRED_BANK_AC+ACQUIRED_BANK_LOAN+HEADSEX11+HEADAGE11+FAMILY_SIZE_CHNG+NMARRIED+NEW_CHILD+WIDOWED+POOR*PER_C_INCOME,data= premium_data_u)

Appendix M- R Codes for Policy Choice and Policy Lapse Models

 # Policy Choice Models

data<-read.csv(file="G:/ /NTFS 1//candata.csv")

 # Recode age variable

data$AGE_Group<-0

data$AGE_Group[data$Age==1]<-1

data$AGE_Group[data$Age==2]<-2

data$AGE_Group[data$Age==4]<-3

data$AGE_Group[data$Age==5]<-4

data$AGE_Group[data$Age==6]<-5

#Define categorical variables

data$AGE_Group<-factor(data$AGE_Group)

data$Age<-factor(data$Age)

data$Gender<-factor(data$Gender)

data$Maritals<-factor(data$Maritals)

data$Employ<-factor(data$Employ)

data$Educ<-factor(data$Educ)

data$Bank<-factor(data$Bank)

data$Income<-factor(data$Income)

#Define Dependent variables

data$TERM1<-0

data$TERM1[data$policy2==1]<-1

data$END1<-0

data$END1[data$policy2==2|data$policy2==3|data$policy2==4]<-1

data$MULTIPLE1<-0

data$MULTIPLE1[data$policy2==7]<-1

data$ULIP1<-0

data$ULIP1[data$policy2==5]<-1

data$END2<-data$END1+data$ULIP1

 # Models for analyzing the effect of saving motives and social motives on policy choice

Term<-glm(TERM1~FAC1_1+FAC2_1,data=data,family = "binomial")

Endowment<-glm(END2~FAC1_1+FAC2_1,data=data,family = "binomial")

Multiple<-glm(MULTIPLE1~FAC1_1+FAC2_1,data=data,family = "binomial")

Models for policy choice

Term<-glm(TERM1~R1+R2+R3+R4+R5+R6+R7+AGE_Group+Gender,data=data,family = "binomial")

Endowment<-glm(END2~R1+R2+R3+R4+R5+R6+R7+AGE_Group+Gender,data=data,family = "binomial")

Multiple<-glm(MULTIPLE1~R1+R2+R3+R4+R5+R6+R7+AGE_Group+Gender,data=data,family = "binomial")

#Policy Lapse model

lapse_data<-read.csv(file="G:/Reasons and Lapse/Lapse_New.csv")

lapse_data$policy2<-factor(lapse_data$policy2)

lapse_data$Age<-factor(lapse_data$Age)

lapse_data$Income<-factor(lapse_data$Income)

lapse_data$Educ<-factor(lapse_data$Educ)

lapse_data$Maritals<-factor(lapse_data$Maritals)

lapse_data$Employ<-factor(lapse_data$Employ)

lapse_data$Gender<-factor(lapse_data$Gender)

#Effect of demographic characteristics on policy lapse

lapse<-glm(Policy_Lapsed_Y_N~Age+Gender+Maritals+ Educ+Employ+Income+,data = lapse_data, family = "binomial")

#Effect of purchase motives and policy type on policy lapse

lapse<-glm(Policy_Lapsed_Y_N~R1+R2+R3+R4+R5+R6+R7+policy2,data = lapse_data, family = "binomial")

summary(lapse)