

Demographic and Household Factors' influence on Life Insurance Lapsation

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Abstract

In this study, we examined the influence of demographic and household factors on a decision to lapse a life insurance policy in India. Lapses in life insurance have been an interesting area of research in academics in developed countries where there exist matured insurance markets. Whereas in India very few empirical studies have been done on the lapsation of life insurance policies. This is the first research to study the influence of demographic and household factors on lapse behaviour in the Indian life insurance market using survey data. A survey of randomly selected 537 policy holders was conducted during the period from July to December 2021. Face-to-face interview of sample respondents using structured questionnaire was done to explore what are the demographics and household factors having influence over the decision to lapse a life insurance policy. We found that age, marital status and occupation have influence over the decision to lapse a life insurance policy. This finding of our study supports and provides a new perspective to the emergency fund hypothesis.

Keywords: Life insurance; Lapse; Persistency; Surrender value; Maturity; Chi-square; Logit model; customer; emerging economies, social sustainability

Introduction

In this study, we examined the influence of demographic and household factors on a decision to lapse a life insurance policy in India. Lapses in life insurance have been an interesting area of research in academics in developed countries where there exist matured insurance markets. Whereas in India very few empirical studies have been done on the lapsation of life insurance policies. This is the first research to study the influence of demographic and household factors on lapse behaviour in the Indian life insurance market using survey data.

The background of this paper is that the Insurance Regulatory and Development Authority of India (IRDAI) in its Handbook on Indian Insurance Statistics 2020-21 has given lapse ratio and persistency figures for life insurers from 2013-14 to 2020-21. Lapse ratio in many of the life insurance companies is not looking good.

Over the last two decades i.e. in the post-reform period, not only the number of insurance players have increased but also a lot of positive changes have happened in the products, method of payment, delivery of service, distribution channel etc. Also, there is a world-class regulatory system to supervise and promote the development of the insurance business in India. In insurance, penetration and density are often used to measure the development of insurance sector in a country. Penetration is the percentage of insurance premium to GDP while density is the ratio of premium to population or per capita premium. In India, insurance penetration has increased from 2.71 per cent in 2001-02 to the highest of 5.20 per cent in 2009-10. Since then, level of insurance penetration declined till 2014-15, and it started increasing again from 2015-16 and it was 4.20% in 2020-21. Insurance density has increased consistently from USD 11.5 in 2001-02 to USD 64.4 in the year 2010-11. After some ups and downs it started increasing again from 2016-17 and in 2019-20 and 2020-21 it remained same at the level of USD 78. As per Swiss Re, in life insurance, India is ranked 10th in the world. Life insurance premium in India has increased by 6 per cent (inflation-adjusted) when global insurance premium has reduced by 3.1 per cent as per the Swiss Re Report (2021). Despite all these improvements, lapse ratio is better only for some insurers and for 7 out of 24 insurers it is still in the double digits in 2019-20, however this number has reduced to five in 2020-21. But for 12 out of 24 insurers lapse ratio is higher than 5%. Persistency ratio of the life insurance industry, on average, has shown a negligible improvement from 68.68 per cent in the 13th month in 2017-18 to 69.01 in the 13th month in 2020-21. Persistency of 69 per cent in the 13th month means one year after the sale only 69 out of every 100 policies were renewed. In other words persistency measures how, long customers persist with their policies.

The handbook has also provided the persistency ratios for 25th, 37th, 48th and 61st months. For the financial year 2020-21, the life insurance industry, on average, had persistency of only 41 per cent in the 61st month. By the 5th year of policy sale, 14 out of 24 life insurers had persistency ratio below this average and four out of 24 life insurers could not retain a half of their policies. Higher lapses or lower persistency is a worrisome situation when we compare with a global average of persistency, which is close to 90 per cent in the 13th month and above 65 per cent after 5 years.

A life insurance policy is said to be lapsed when the policy owner discontinues the payment of premium falls due before the policy attains the surrender value or maturity benefit for any reason other than the death of policy owner. When there is neither a surrender benefit nor a maturity benefit lapsation of a policy will result in the loss of premium already paid as well as the benefit of life coverage. Life insurance policies are long term contracts and customers would get the benefit only if they continue to pay the premium for the entire term of the policy. Huge early lapses or a lower persistency will also pose a threat to the financial health of insurance companies.

Literature review

Lapsation in the insurance industry and in the insurance market is a very important phenomenon (Fang & Kung, 2012). Lapsation of an insurance policy is considered to be the most critical problem being faced by any insurance company in India (Suresh & Ramesh, 2011). The lapsation has significantly indirect relation with the performance of the policy (James & Randy, 1998).

The Kannan et al. (2008) in their research study on insurance lapsation in Indian insurance industry found that age at the entry to the policy, premium mode being used to service the policy, type of the policy are the main factors which influence the lapsation. The same research also suggested that the measures like campaigns and incentives to policyholders and intermediaries might prove useful in curbing lapse rate.

The study conducted by Stephen & Andre (2012) about the impact of household factors on lapse conclude that households which have experienced income shock are more likely to lapse in comparison to others. In the same study, it is stated that lapse is more by younger policyholders than by older ones. The purchase of the new policy will also have a significant and positive relationship with the lapsation of earlier policies. Financial hardships being faced by the policyholders also have a direct relation to the lapsation of policy (Stephen & Andre, 1998).

A research paper by Adjmal S. Sirak (2015) proved that controlling for age, income and wealth of policyholders have no effect on lapse rate. However, this study has also proved that unemployment has a role to play in policy lapsation. The findings of this paper contradict the findings of the study done by Kuo, Tsai and Chen (2003) which proposed that unemployment has no role in lapsation. Research by Fang and Kung (2012) links policy surrender with the age or gender of the policyholder. Nolte & Schneider (2015) included family information, education, finances and health of the policyholder in their study. According to their research, financial literacy tends to decrease the surrender of policy; hence the literacy level of the insured has a role in the lapsation of the policies. Even the income shocks of insured are also a factor in influencing the lapsation of life insurance policies. Further lapse is severe among policyholders who are in the higher age bracket (Fang & Kung, 2012).

Gemmo and Martin (2016) in their working paper demonstrated that demographic variables like Age, Marital Status, Birth of a child, number of children, acquisition of assets, employment, income have got their influence on the surrender of a life insurance policy. Age has greater influence on surrender of policy. According to them, old people tend to surrender their policies more often than the younger ones. This study also states that any situation leading to the acquisition of assets may cause surrender of policy. In the same paper the authors have concluded that shock in household income can also be a reason for surrendering a life insurance policy.

Objectives

Life insurance policy lapses are tested using macroeconomic data in most of the literature. Macroeconomic data analysis provides an insight into the general determinants of lapsation of life insurance policies. Very limited literature is available on analysis of microeconomic and household data that lead to a lapsation of a life insurance policy. Hence the purpose of this research paper is to analyze whether the demographic and household factors influence the decision to discontinue a life insurance policy before it attains a surrender value.

Data and Methodology

In India the secondary data resources which can be used to analyze the lapse determinants are very limited unlike in developed countries. Publicly available data regarding lapse available with IRDA are limited to lapse ratio and persistency ratio of insurance companies. Insurance companies do not share any kind information about the policyholders who have lapsed or surrendered their policy. Hence the data and information required for this research are collected from people who own life insurance policies and an enquiry has been done whether

they have lapsed or surrendered their policy before maturity and the factors driving for such behaviour.

During the survey respondents were randomly selected and data and information were gathered through face to face interview using a structured questionnaire. We approached more than 1000 people but could collect required data from only 537 people who owned life insurance policies after 2001. Of which, 128 policyholders lapsed their policies before they attained the surrender value and 135 policyholders surrendered their policies before maturity. During the survey demographic and household data were collected from the people who lapsed their policies as well from those who continued their policies. The collected data were analyzed using SPSS and Gretl. Cross tabulation and Pearson’s Chi-square were used to examine the association between demographic and household factors and decision to lapse a life insurance policy. A logit model was developed using Gretl to test the marginal effect of demographic and household factors having an association with the decision to lapse a life insurance policy.

Results and Discussion

The objective of this research is to find out whether demographic and household factors drive a decision to lapse a life insurance policy before it attains a surrender value. The findings of the study are presented below. Sample for this study consisted of 537 respondents who owned life insurance policies. In order to determine whether the policy has lapsed, surrendered or continuing, we mainly focused on the following two questions in the survey.

Question 1: Have you ever discontinued any of your policies (lapsed) before the policy attaining the surrender value?

Question 2: Have you ever surrendered any of your policies before the policy attaining maturity?

Respondents who answered in affirmative to the first question were classified as having lapsed policy and were asked several additional questions to probe into the reasons to lapse a policy. Respondents who answered in affirmative to the second question were classified as having surrendered a policy and were asked several additional questions to probe into the reasons to surrender a policy. Respondents who answered in negative to both the questions were classified as having a continued policy and were asked several additional questions to probe into the factors that could produce better persistency. Table 1 exhibits the classification of a total of 537 respondents into the number of male/female respondents who have lapsed, surrendered and continuing their life insurance policies.

Table 1. Status of policy owned by the sample respondents

Policy holders	Status of the life insurance policy			
	Lapsed	Surrendered	Continuing	Total
Male	73(57%)	82(61%)	182(66%)	337(63%)
Female	55(43%)	53(39%)	92(34%)	200(37%)
Total	128(100%)	135(100%)	274(100%)	537(100%)

Source: Field Survey

Demographic Profile of Respondents

Table 2 exhibits the demographic profile of our sample respondents, and the results cross-tabulation and Pearson’s Chi-square test for lapse and demographic and household variables. For this study 537 respondents were surveyed, of which, 63 per cent (337) are males and 37 per cent (200) are females. 396 respondents (72.8%) were married and 141 respondents were unmarried. When we look at the age of the respondents, 170 respondents (31.7%) are in the

age group of 20-30, 118 are in the age group of 31-40 (22%), 138 are in the age category of 41-50 (25.7%) and 111 are above 51 years of age (20.6%).

Information about the educational qualification of respondents was collected. 87 respondents had educational qualification of SSLC or below, 111 respondents had educational qualification of intermediate, 122 were graduates and 177 were postgraduates. We also looked at the occupation of our respondents. Maximum of 208 respondents were the employees of either the public or private sector with a guaranteed regular income. 147 respondents' income came from business, and 43 respondents drew their income from agriculture. 87 housewives and 52 students who owned life insurance policies had no income of their own and their policies were serviced by their husbands and parents.

This study also collected information about the size of the family and the number of dependents of sample policyholders. There were 226 sample policyholders with a family of 4 members, the family size of 135 sample respondents was less than 4 members and 176 respondents had a family with more than 4 members. Of the 537 respondents, 147 respondents had no dependents, 192 respondents had 1-2 dependents and 198 respondents had 3 and more dependents.

Table 2. Pearson's Chi-Square test for Lapse and demographic and household variables

Demographic variables		Frequency	Have you ever discontinued any of your policies before the policy attaining the surrender value? Cross tabulation				H ₀ Rejected at $\alpha = 0.05$
			Yes	No	Chi-square	p-value	
Gender	Male	337 (62.8)	73 (57%)	264 (64.5%)	2.357	0.125	No
	Female	200 (37.2)	55 (43%)	145 (35.5%)			
Age category	20-30	170 (31.7)	23 (18%)	147 (35.9%)	19.209	0.000	Yes
	31-40	118 (22.0)	29 (22.7%)	89 (21.8%)			
	41-50	138 (25.7)	48 (37.5%)	90 (22%)			
	51 & above	111 (20.6)	28 (21.9%)	83 (20.3%)			
Qualification	SSLC	87 (16.2)	27 (21.1%)	60 (14.7%)			No
	Intermediate	111 (20.7)	31 (24.2%)	80 (19.6%)	5.739	0.125	
	Graduation	222 (41.3)	48 (37.5%)	174 (42.5%)			
	Post-graduation	117 (21.8)	22 (17.2%)	95 (23.2%)			
Marital Status	Unmarried	141 (26.3)	21 (16.4%)	120 (29.3%)	8.422	0.004	Yes
	Married	396 (73.7)	107 (83.6%)	289 (70.7%)			
Occupation	Agriculture	36 (6.7)	6 (4.7%)	30 (7.3%)			Yes
	Business	147 (27.4)	38 (29.7%)	109 (26.7%)			
	Employees of public sector	71 (13.2)	13 (10.2%)	58 (14.2%)	23.093	0.000	
	Employees of private sector	144 (26.8)	32 (25.0%)	112 (27.4%)			

	Housewife	87 (16.2)	35 (27.3%)	52 (12.7%)			
	Student	52 (9.7)	4 (3.1%)	48 (11.7%)			
Size of the family	Less than 4	135 (25.1)	36 (28.1%)	99 (24.2%)	2.347	0.309	No
	4	226 (42.1)	57 (44.5%)	169 (41.3%)			
	greater than 4	176 (32.8)	35 (27.3%)	141 (34.5%)			
No. of dependents	Zero dependents	147 (27.4)	29 (22.7%)	118 (28.9%)			
	1-2 dependents	192 (35.7)	56 (43.6%)	136 (33.3%)	4.861	0.088	No
	3 and more dependents	198 (36.9)	43 (33.6%)	155 (37.9%)			

Source: Field Survey

Pearson's Chi-Square Statistics

Whether a decision to lapse an insurance policy is independent of demographic and other related factors are tested using Pearson's Chi-Square statistics. Pearson's Chi-Square test follows an asymptotic chi-square distribution with $(R-1)(C-1)$ when the row and column variables are independent. Table 2 gives the analysis of cross-tabulation and the results of Pearson's Chi-Square statistics for the lapse and demographic and other related variables.

Pearson's Chi-Square test is used to examine the association between decision to lapse an insurance policy and the gender of a policy owner. Hence,

H₀: Gender and decision to lapse an insurance policy are independent

H₁: Gender and decision to lapse an insurance policy are associated (not independent)

The Chi-Square test result indicates that for our survey data with Chi-Square value of 2.357, there is no association between a person's gender and decision to lapse a life insurance policy (p-value = 0.125)

Pearson's Chi-Square test is used to examine the association between decision to lapse an insurance policy and the age of a policy owner. Hence,

H₀: Age category and decision to lapse an insurance policy are independent

H₁: Age category and decision to lapse an insurance policy are associated (not independent)

The Chi-Square test result indicates that for our survey data with Chi-Square value 19.209 there is an association between a person's age and decision to lapse a life insurance policy (p-value = 0.000)

Pearson's Chi-Square test is used to examine the association between decision to lapse an insurance policy and the qualification of a policy owner. Hence,

H₀: Qualification and decision to lapse an insurance policy are independent

H₁: Qualification and decision to lapse an insurance policy are associated (not independent)

The Chi-Square test result indicates that for our survey data with the Chi-Square value 5.739 there is no association between a person's qualification and decision to lapse a life insurance policy (p-value = 0.125)

Pearson's Chi-Square test is used to examine the association between decision to lapse an insurance policy and the occupation of a policy owner. Hence,

H₀: occupation and decision to lapse an insurance policy are independent

H₁: occupation and decision to lapse an insurance policy are associated (not independent)

The Chi-Square test result indicates that for our survey data with the Chi-Square value 23.093 there is an association between a person's occupation and the decision to lapse a life insurance policy (p-value = 0.000)

Pearson's Chi-Square test is used to examine the association between decision to lapse an insurance policy and the marital status of a policy owner. Hence,

H₀: Marital status and decision to lapse an insurance policy are independent

H₁: Marital status and decision to lapse an insurance policy are associated (not independent)

The Chi-Square test result indicates that for our survey data with the Chi-Square value 8.422 there is an association between a person's marital status and decision to lapse a life insurance policy (p-value = 0.004)

Pearson's Chi-Square test is used to examine the association between decision to lapse an insurance policy and the family size of a policy owner. Hence,

H₀: Family size and decision to lapse an insurance policy are independent

H₁: Family size and decision to lapse an insurance policy are associated (not independent)

The Chi-Square test result indicates that for our survey data with the Chi-Square value 2.347 there is no association between a person's family size and decision to lapse a life insurance policy (p-value = 0.309)

Pearson's Chi-Square test is used to examine the association between decision to lapse an insurance policy and the number of dependents of a policy owner. Hence,

H₀: number of dependents and decision to lapse an insurance policy are independent

H₁: number of dependents and decision to lapse an insurance policy are associated (not independent).

The Chi-Square test result indicates that for our survey data with the Chi-Square value 4.861 there is no association between the number of dependents and decision to lapse a life insurance policy (p-value = 0.088)

Logit Model

Pearson's Chi-Square statistics displayed in Table 2 indicates that there is an association between age, marital status and occupation of respondents and decision to lapse a life insurance policy as p-value in these three cases are less than the significance value of 5 per cent. Hence the decision to lapse a life insurance policy is influenced by these three variables. So age, marital status and occupation were selected for logistic regression analysis.

The lapse of life insurance policy (0 = not lapsed and 1 = lapsed) was the dependent variable. Age, marital status and occupation are independent variables which are also categorical and dichotomous. When both dependent and independent variables are dichotomous logit model is used. The three independent variables namely age group, marital status and occupation group are included in the model. Cross tabulation results given in table 2 indicate that among the policyholders who have lapsed their policies, people falling in the age group of 41-50 are the highest. So, we have assigned 0 for all the respondents falling in the age group other than 41-50 and 1 for the respondents falling in the age group of 41-50. Policyholders who are married are the highest to lapse among those who have lapsed their policies. So, we have assigned 0 for the respondents who are unmarried and 1 for married. Similarly, from the cross-tabulation result, it is clear that among the policyholders who have lapsed their policies respondents with their occupation as a business are the highest. So, we have assigned 0 for all the respondents falling in the occupation category other than business and 1 for the respondents falling in the occupation category of business.

Logit model is constructed in Gretl employing maximum likelihood method and the probability of lapsation of a policy by the policy owner is estimated on the basis of age, marital status and occupation of the policy owner.

Logit model is estimated as follows:

$$\text{Lapse} = \beta_0 + \beta_1 \text{Agegroup}_i + \beta_2 \text{Maritalstatus}_i + \beta_3 \text{Occupationgroup}_i + \mu_i$$

Where lapse is equal to one if individual i has lapsed the policy, zero otherwise, marital status is equal to one if the individual i has lapsed the policy with the marital status as married, zero otherwise, Age group is equal to one if the individual i has lapsed the policy falling in the age group of 41-50, zero otherwise, occupation is equal to one if individual i has lapsed the policy is having business as his/her occupation, zero otherwise.

Logit model is defined as

$$\text{LN}(P_i/1-P_i) = \beta_0 + \beta_1 X_i + \beta_2 X_i + \beta_3 X_i + \mu_i \quad (1)$$

Our model is estimated as

$$\text{LN}(\text{Lapse/No Lapse}) = \beta_0 + \beta_1 \text{Agegroup}_i + \beta_2 \text{Maritalstatus}_i + \beta_3 \text{Occupationgroup}_i + \mu_i \quad (2)$$

Model 1: Logit, using observations 1-537

Dependent variable: Lapse

Standard errors based on Hessian

	<i>Coefficient</i>	<i>Std. Error</i>	<i>z</i>	<i>p-value</i>	
Constant	-1.80822	0.241285	-7.494	<0.0001	***
AgeGroup	0.626137	0.225224	2.78	0.0054	***
MaritalStatus	0.570751	0.273345	2.088	0.0368	**
Occupationgroup	0.070697	0.228829	0.309	0.7574	

Mean dependent var	0.238361	S.D. dependent var	0.426478
McFadden R-squared	0.028262	Adjusted R-squared	0.014699
Log-likelihood	-286.5767	Akaike criterion	581.1534
Schwarz criterion	598.2974	Hannan-Quinn	587.86

Number of cases 'correctly predicted' = 409 (76.2%)

F (beta'x) at mean of independent vars = 0.426

Likelihood ratio test: Chi-square (3) = 16.6698 [0.0008]

	Predicted	
	0	1
Actual 0	409	0
Actual 1	128	0

Excluding constant, p- value was highest for variable 4 (occupation)

Logit estimates of equation (2) are obtained using Gretl. Following is the Logit equation of our lapse model. Figures in parentheses are standard errors based on Hessian

$$\text{Lapse} = - 1.80822 + 0.626137 \text{Agegroup} + 0.570751 \text{Marital status} + 0.070697 \text{Occupation}$$

(0.241285)
(0.225224)
(0.273345)
(0.228829)

From the model, it is clear that the effect of age group and marital status is statistically significant. However, the coefficients in the output are not interpreted as marginal effects. To obtain marginal effect we need to re-estimate the model by selecting the option “shows the slopes at mean” and we get Logit model 2. The marginal effect of age group is 0.119. A policyholder falling in the age group of 41-50, will increase the probability of lapsing the policy by 12 per cent. Policyholders at this age, generally, have financial commitments towards children’s higher education/or marriage etc.,

Further, it is at this age, generally, people plan for realizing their dream of owning a house. So, policyholders, at this age often face financial hardships and use the funds for personal projects that would otherwise go to the premium payment. Hence, the liquidity needs for personal projects force policyholders to lapse life insurance policies. The marginal effect of marital status is 0.093. A policyholder having the marital status of 'married' will increase the probability of lapsing the policy by 10 per cent. Marriage in India is an expensive affair and having married/marital status brings with it several responsibilities and financial conditions change.

Women after marriage in India generally move to husbands' house and their financial conditions change. Quite often it takes time to find a new job in the new region and makes these women after marriage financially vulnerable which forces them to lapse their life insurance policies. Similarly, the marginal effect of occupation is 0.01. A policyholder having business as his/her occupation will increase the probability of lapsing policy by one per cent. Compared to public/private sector employment, business as an occupation has an irregular flow of income. Policyholders with small businesses whenever faced with debt and other types of financial hardships let go of their policies to lapse. Overall, the model gives 76 per cent correct prediction.

Model 2: Logit, using observations 1-537

Dependent variable: Lapse

Standard errors based on Hessian

	<i>Coefficient</i>	<i>Std. Error</i>	<i>Z</i>	<i>Slope*</i>
Const	-1.80822	0.241285	-7.494	
AgeGroup	0.626137	0.225224	2.78	0.119655
Marital Status	0.570751	0.273345	2.088	0.0937334
Occupation	0.070697	0.228829	0.309	0.0126367

Mean dependent var	0.238361	S.D. dependent var	0.426478
McFadden R-squared	0.028262	Adjusted R-squared	0.014699
Log-likelihood	-286.5767	Akaike criterion	581.1534
Schwarz criterion	598.2974	Hannan-Quinn	587.86

*Evaluated at the mean

Number of cases 'correctly predicted' = 409 (76.2%)

F(beta'x) at mean of independent vars = 0.426

Likelihood ratio test: Chi-square (3) = 16.6698 [0.0008]

	Predicted	
	0	1
Actual 0	409	0
Actual 1	128	0

Excluding constant, p- value was highest for variable 4 (occupation)

Conclusions

Life insurance policy lapses may prove fatal to the profitability, liquidity and solvency of companies. Lapsation and surrender activity represents an erosion of the customer base, which is likely to lead to an increased fixed administrative cost per policy and require substantial marketing expenditures to rebuild (David T. Russell and others 2013). Belth (1975) and Carson and Dumm (1999) found that high levels of lapsation, *ceteris paribus* resulted in a significantly higher cost for life insurance.

Majority of available studies on lapsation have used macro-economic data for testing lapse determinants and very few studies have used microeconomic factors which include household-specific and life cycle factors like family size, number of earning members, education, employment status, marital status, debt status, income/wealth shocks etc. that drive the lapse decision.

Results of our study suggest that demographic and household factors influence the decision to lapse a life insurance policy. Age and marital status are statistically significant predictors of decision to lapse a policy. The findings of our study are in support of the Emergency Fund Hypothesis - one of the principal hypotheses about lapse behaviour which has been discussed and proved in most of the existing literature. Emergency Fund Hypothesis states that policyholders consider their life insurance policies as a source of emergency funding in times of financial need. In addition to this, the shortage of money and liquidity needs for personal projects force the policyholders to lapse their life insurance policies as a last resort (Linton 1932; Outreville 1990; Kuo et al 2003; Kim 2005a).

The findings of this research have two major implications. Firstly, the insurers have to monitor lapse behaviour to prevent financial losses and attract more and more new businesses. Lapse behaviour of policyholders not only affects financial performance/solvency but also many other activities like product design, product pricing, asset-liability management, risk management etc. With the ICT revolution information about financial products and financial markets are easily and quickly available to investors. Thus, insurance companies/ intermediaries must map the insurance product features with the needs of customers and pay attention to market the need-based products.

Secondly, policyholders' personal plans (e.g. purchase/construction of the house, children's education/marriage) are very difficult to anticipate for the insurance companies, but they remain the most significant drivers of lapsation and hence due consideration be given to household-specific and life cycle factors while designing life insurance products.

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