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Macroeconomic factors affecting insurance penetration in India

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Abstract
The purpose of this research was to thoroughly investigate numerous factors influencing insurance demand in light of current developments regarding the entrance of FDI into the insurance industry and the sector's increasing importance. The Granger Causality test and regression will be used in the study to examine some of the key elements. It has examined some of the contributing elements and their predicted relationships. We investigate if the link between population, literacy, life expectancy, and financial development in India by using regression analysis and the Granger Casualty test. By considering insurance penetration and insurance density, we have examined and evaluated these factors.

Keywords: Population, literacy, life expectancy, and financial development

Introduction
The COVID-19 epidemic brought to light the necessity for customers to make purchases that boost their financial stability, one of which is life insurance. According to a press release, Benori Knowledge, a cutting-edge provider of custom research and analytics solutions, found that India's life insurance penetration rate increased from 2.8% in December 2019 to 3.2% in December 2021, nearly matching the global average of 3.3%. The report tracked the performance of the li The life insurance market grew at a CAGR of 11% for total premium and 17% for new business premium from 2017 to 22. Until 2027, it is predicted to expand at a CAGR of 9%. India ranks 10th in the world's life insurance market with a penetration rate of 3.2%, ahead of China (at 2.4%) and the UK (at 3%). Life insurance industry over the previous five years and outlined emerging trends in the domain. The paper is organized into 4 sections. The first section gives us factors affecting demand for life insurance. The second section is literature review and third section covers aspects of empirical investigation and fourth section is conclusion and recommendation

Factors affecting demand for life Insurance
1. Per capita GDP. Per capita GDP is expected to have positive relationship with the demand for life insurance. Since higher the income of an individual, higher is the demand for life insurance.
2. Education is expected to have positive relationship with the demand for life insurance because it makes the insurance both valuable(due to higher income) and knowledgeable
3. Age dependency ratio is the ratio of dependents--people younger than 15 or older than 64- to the working-age population--those ages 15-64. It is expected to have positive relationship with demand for life insurance
4. Urbanization has a encouraging relation and apply corroborate with the justification that as more and more urban center are created, the demand or consumption of insurance products would increase.
5. Financial development has a positive relation with both penetration and density suggesting that as the financial system as a whole grows; it will have a positive impact in raising demand for insurance products.
6. Population is expected to have positive relationship with demand for life insurance because it will make fair price for life insurance products.

7. Life expectancy tends to negatively related with the demand of life insurance
8. Market concentration is expected to have positive relationship with demand for life insurance
9. Unemployment tends to have negative relationship with demand for life insurance which is obviously going to insurance less valuable.

Literature Review

According to various studies, Per capita income has Positive impact on demand for life insurance. (Outreville (1980, 1985) [2, 8]; have establish positive impact of permanent income on life insurance demand. Beck and Webb (2003; Li et al. (2007) [4] have shown negative relationship between lfe insurance and anticipated inflation. Unemployment rate have Negative impact on insurance demand as indicated by Mantis and Farmer (1968) [5]; Outreville (1980) [2]; Beenstock et al. (1986) [11]; Lenten and Rulli (2006) [12]. Demographic factors such as Population size/density is positively related as per Mantis and Farmer (1968) [5]; Feyen et al. (2011). Outreville (1996) [9]; Szablicki (2002); Beck and Webb (2003) [4]; Hwang and Gao(2003); Hwang and Greenford (2005); Sen (2008); Chen et al. (Forthcoming) have found positive impact of urbanization on life insurance. The size of the population has of course a positive effect on the demand for insurance, but most studies are considering per capita variables to discount this effect. Population density should also have a positive effect on life insurance. Economies with a higher share of urban to total population are expected to have higher levels of life insurance consumption because urbanization simplifies the distribution of these products. Price of insurance have inverse impact on demand for life insurance which is also indicated Mantis and Farmer (1968) [5]. Legal environment is positively related to insurance demand as per Webb et al. (2002) [20]; Beck and Webb (2003) [4]; Feyen et al. (2011) [13]. Enforcement of property rights/law also Positively impact demand for life insurance as found out by; Feyen et al. (2011) [13].Webb et al. (2002) [20]; Beck and Webb (2003) [4] shows out political risk negatively to the demand of life insurance. Headen and Lee (1974) [19] note that a positive sign and elastic effect of stock prices could simply be that higher stock prices generally tend to be coincident with a growing economy, higher personal incomes, and higher net savings levels.. Papers by Outreville (1990a, 1996) [9], Ward and Zurbruegg (2002) [21], and Li et al. (2007) find out a direct relationship between insurance and the size of the financial sector. However, as noted for real interest rates, the sign of this variable is ambiguous.

Empirical Investigation

1. **To analyses some of the factors affecting demand for life insurance we made the following model;**

DEN = a +a_1POP + a_2NDP per capita+ a_3 LIT+ u

Where, POP is log of Population, NDP is log of NDP per capita, LIT is Log of Literacy Rate, Den is log of life insurance density. It is a cross sectional model which is based on state wise data

The result of the above model is as follows:

DEN = -12.94 +0.123 POP +1.137 NDP per capita+ 1.125 LIT+ u

Adjusted R^2 = 66% (-3.13) (2.42) (5.04) (1.15)

() is t value

It can be interpreted as that if population increases by 1%, density increases by 0.123%. If Per capita NDP increases by 1%, density increases by 1.137% and 1 % rise in literacy increases 1.125 % increase in density. The result is significant Population and NDP per capita, but insignificant for Literacy. Adjusted R square is 66% which suggest model is quite good.

2. Premium Growth Rate

We have used the following model to find out the growth rate for premium

LnPrem = a + bT + u

Ln Prem = 0.4787 + 0.1663*T

(4.76) (22.69) R^2 =96%

Where Ln Prem is the natural log of Premium
T is the respective year
() is the t statistics

Instantaneous rate of growth of premium over 1990 to 2022 on an average is 16.6% and significant at 5% and compound rate of growth is found to be 18% which is antilog of b minus.

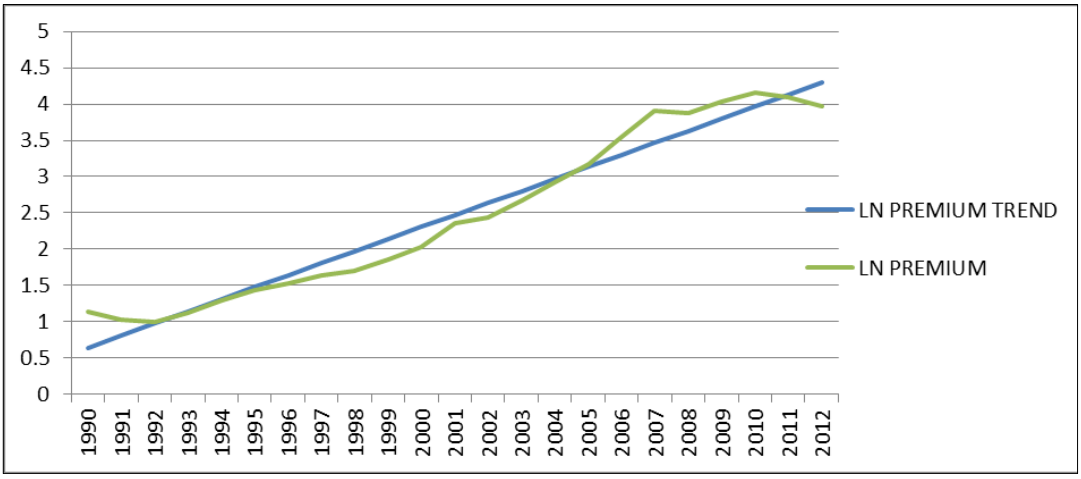

Fig 1: The results is also visible from the following graph

2. Insurance and Growth

It is our expectation that if GDP increases, then Premium are expected to rise and this relationship is to be verified by using the following model:

Ln Prem = a + b Ln GDP + u

= -8.99+ 1.8 Ln GDP

(-22) (28.6) R^2 =97%

Where Ln Prem is the natural log of Premium

Ln GDP is the natural log of GDP

() is the t statistics

The interpretation of the result is that if GDP increased by 1%, then life insurance premium will be increased by 1.8% which is significant as suggested by t statistics.

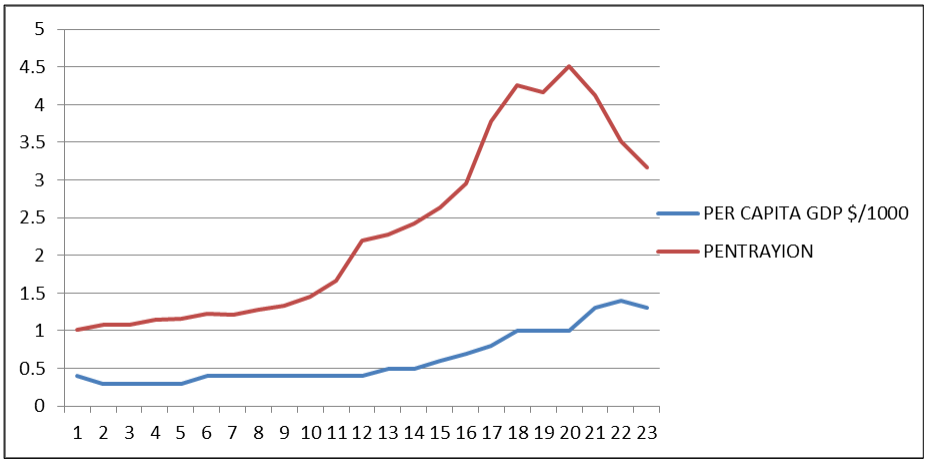

Fig 2: Penetration and per capita GDP

PENETRATION = a + b PERCAPITA GDP + u

U is country specific residuals

B is found to be 0.25 which is significant as p value is 0, which says as per capita GDP increase by 1, insurance penetration will go up by 0.25.

To test demand following and supply leading hypothesis that is whether increasing GDP is causing Premium (life Insurance sector) to rise or increasing LIFE Insurance sector (increasing Premium) causes GDP to rise. We need to conduct Granger Causality test. But Before doing so, we need to make sure that or variables are stationary. We apply augmented dickey fuller unit root test in order to identify whether are stationary at level figure. Both GDP and Premium are not stationary at first level and at first difference, but it is stationary at second difference since P value is 0.00 at second difference. Hence we have to make two new series that GDP at second difference (DDGDP) and Premium at second difference (DDPREM).

Table 1: Pairwise Granger Causality Tests

Sample: 1990 2022			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
DDPREM does not Granger Cause DDGDP	19	0.24093	0.7891
DDGDP does not Granger Cause DDPREM		7.58112	0.0059

The above results show that at lag 2, at 5% significant level DDGDP is causing DDPREM but not vice versa. Our result is not significant at lag1 to 4 levels.

3. Financial Development and Insurance Penetration

Table 2: Pairwise Granger Causality Tests

Sample: 1990 2022			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
DM3GDP does not Granger Cause DDPEN	19	4.03293	0.0414
DDPEN does not Granger Cause DM3GDP		1.55959	0.2446

The correlation between financial development (M3/GDP) and insurance penetration is found to be 87%. To find out whether financial development is causing insurance penetration, we again conduct Granger Causality test. We make our series stationary by generating two new series at first difference that is M3/GDP at first difference (DM3GDP) and Insurance penetration at second difference (DDINSPEN) by conducting unit root test.

It means that financial development causes insurance penetration to rise at 5% level at lag 2

A. Conclusion and Recommendations

The demand for life insurance may be positively impacted by population expansion, income growth, and increased literacy. In contrast to literacy, the results are substantial for population and NDP per capita. Over the period from 1990 to 2022, the premium grew at an average instantaneous rate of 16.6% and a compound rate of 18%. According to the result's interpretation, if GDP grows by 1%, life insurance premiums will rise by 1.8%, and if per capita GDP grows by 1%, insurance penetration will increase by 0.25. Additionally, the findings demonstrate that at lag 2, at a 5%

significant level, growth is driving up premium but not the other way around. Increased financial development leads to a 5% increase in insurance penetration.at lag 2. Due to the limitations of time series analyses, we did not include many additional factors impacting the demand for life insurance that were described in the previous portion of the study. These elements will be included in the subsequent study. It has been observed that the recession's effects have had a significant negative impact on life insurance demand in 2022. Additionally, internal demand variables must be taken into account when allocating agents for life insurance in different states. Given that economic growth, financial development, and political stability are all expected to increase, it is projected that demand for life insurance will increase.

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