A STUDY ON DETERMINANTS OF INSURANCE PENETRATION IN THE CONTEXT OF INDIA

Somnath Das
Faculty, Department of Commerce, Burdwan Raj College, Burdwan, West Bengal, India

Mihir Kumar Shome
Associate Professor and H.O.D- Management and Humanities, National Institute of Technology, Ministry of Human Resource Development (Government of India), Arunachal Pradesh, India

ABSTRACT

Insurance Penetration represents potentiality of the insurance sector in a country. Technically, it indicates the ratio between insurance premium and Gross Domestic Product of a country. So, it will vary due to the variation of these two determinants (Insurance Premium & Gross Domestic Product) over the time. But this ratio not only depends on these two determinants, some other determinants also influence it. Other determinants like inflation rate of country, Foreign Direct Investment inflow, education, openness ratio, life expectancy, labour productivity ratio, Global Terrorism Index, Dependency Ratio etc. The objective of the study is to find out the effect of these eight determinants on Insurance Penetration. SPSS (Statistical Package for Social Science) were used for analyzing the data. Descriptive statistics like mean and SD, Inferential Statistics like ‘t’ test and Multivariate analysis Multiple like Regression Analysis were employed to analyze the data for 23 years (1992-2014) data of India. The results shows that all determinants have an effect on Insurance Penetration but only one determinant has a significant effect on this.

Key words: Gross Domestic Product, Foreign Direct Investment, Insurance Penetration, Global Terrorism Index, Openness Ratio.


http://www.iaeme.com/ijmhrm/issues.asp?JType=IJMHRM&VType=7&IType=3

1. INTRODUCTION

Economic growth of a country (measure through Gross Domestic Product i.e. GDP) and development of insurance sector are positively related to each other (Han et al., 2010). Even, GDP of any country positively and significantly is influenced by the development of Insurance sector (Vadlamannati, 2008; Peter and Kjeli, 2006; Cristea et al., 2014; Manjuana et al., 2009; Curak and Loncar, 2012; Curak, 2009; and Horng et al., 2011). On the other hand, development and stability of growth of insurance sector depends on various factors like insurance premium, population of country, income, wealth and legal system, premium of property liability insurance, gross national product, income and interest rate, net worth holding of individual, stage in the life cycle, education, occupation of individual etc. (Brown et al., 2000; Hammond et al., 1967; Beenstock et al., 1998). Moreover, some socio-demographic factors like marriage,
pattern of family structure etc. also influence the development of insurance sector (Burnett and Palmer, 1984). Therefore, development and potentiality of this sector are not independent. Development of insurance sector measures through insurance penetration. Insurance Penetration fluctuates over time. Hence, it is expected that its nature of volatility spread on the variation of some determinants.

Insurance penetration may be defined as the ratio of total amount of insurance consumption and Gross Domestic Product of a country and depends on the demand for insurance. Different researchers argued that demand of insurance influence by different determinants. Brown and Kim (1993) conducted a study on per capita life insurance consumption of 45 countries for the period 1980 to 1987 and found that there is a positive impact of income and social security expenses with insurance consumption. Further, the study reveals that GDP and Consumption Price Index in a Muslim country have a negative impact on life insurance. Zhuo (1998) conducted two studies: i) one study for the year 1995 and ii) a time series analysis during the period of 1986 to 1995 in a different region of China. Results show that GDP per capita and consumer price indexes are significantly influence the insurance consumption. Beenstock et al. (1998) applied multiple regression analysis on relevant data of 12 countries during the year 1970 to 1981 for identifying the effect of the gross national product, income and interest rate on Insurance consumption. This study reveals that there is positive effect of these determinants on insurance consumption. Hammond et al., (1967) conducted a study on demand for life insurance for identifying the effect of some determinants by using regression analysis. The result shows that demand of life insurance is significantly affected by net worth holding of individual, income, stage in the life cycle, education, occupation of individual etc. Neumann (1969) conducted a study for examining the effect of inflation on life insurance demand for the period 1946-1964 by using time series regression analysis. Other determinants used in the study were income, the birth of urban households and number of marriages etc.and shows that inflation has no significant effect on life insurance demand. Effects of a different social problem on insurance consumption are calculated in the study of Berekson (1972) and investigated that the effect of age, number of children, gross income, the birth order among siblings and parents divorced on life insurance consumption. His study reveals that all determinants have a significant effect on life insurance consumption. Fortune (1973) conducted a study for examining the effect of wages, non-human wealth held, discount rate, and consumer confidence on life insurance consumption by using regression analysis method for the duration 1964 to 1971. These study shows that all the elements have a significant effect on insurance consumption but the effect of non-human wealth is negative and other have a positive impact on consumption. Anderson and Nevin (1975) in a study found that life insurance consumption behavior is also influenced by young newly married couples. Further, they examine the effect of 20 independents variables on life insurance consumption during the period 1968 to 1971. The study reveals that six independent variables have statistically significant effect i.e. education, current household income, expected household income, husband’s insurance before marriage, wife’s insurance before marriage and net worth of household etc. Burnett and Palmer (1984) conducted a study for examining the effect of psychographic and demographic variables on demand of life insurance and found that psychological and demographical effects on insurance consumption are reflected in the study. Psychographic variables like work fatalism, ethic, socialization preference, religion salience, and assertiveness are the most important determinants that influence life insurance consumption. Trueett and Trueett (1990) in a study in Mexico and found that age, education, and income of the individual positively influence the demand for insurance. Browne and Kim (1993) analyzed the impact of income, dependency ratio and government spending on social security on life insurance consumption during the period 1980 to 1987 by applying regression analysis. The result shows that the impact of inflation, the price of insurance and religious are negative and education and life expectancy variables have not very strong significance effect. Research study of Beck and Webb (2003) reveal that inflation, income per capita, banking sector development, religious and institutional indicators are the most important variables for determining the demand for life insurance whereas education, life expectancy, dependency ratio, the amount of the social security have less impact on life insurance consumption. This conclusion was made by analyzing the data of 68 countries during the period of 1961 to 2000. Hwang and Greenford (2005) conducted a study using seven determinants for analysis the impact on
life insurance consumption in China, Hong Kong, and Taiwan. They found that education, income; and economic development have a positive impact on demand for life insurance whereas one child policy and social structure have a negative impact on life insurance consumption. On the other hand, price and social security have no significant impact on demand for life insurance. Li et al. (2007) conducted a study among 30 OECD countries for examining the effect of nine determinants of life insurance consumption by using cross section data during the period 1993 to 2000. The study reveals that number of dependents, income, financial development, the level of education and degree of competition are positively related with life insurance demand whereas social security expenditure, life expectancy, real interest rates, inflation rate decrease life insurance consumption in OECD countries. Mantis and Farmer (1968) examined the determinants for the demand of life insurance in America during the period 1992-1964. Zietz (2003) conducted a study which examines the impact of determining factors on consumer’s life insurance demand in China. Brown et al. (2000) analyzed the effect of various factors like wealth, income and legal system etc. on liability insurance consumption of OECD countries during the period of 1993 to 2000. The result indicates that insurance consumption has a positive relation with legal system and income of the individual. Beck and Webb (2002) examined the relationship of life insurance penetration with GDP, inflation volatility, real interest rate, the percentage of private savings etc by using Cross-country data and time series analysis technique. The result shows that positive relationship exists among the variables. Zhang & Zhu(2010) found that the development of China’s insurance sector (Insurance penetration) depends on total population, savings deposit, education attainment, telephone ownership per capita, social welfare expenditure and young dependency.

Due to lack of work on the determinant of insurance penetration, effects of determinants on insurance demand are depicted by above literature reviews. It is clear that demand for insurance depends on various determinants like age, income, legal system, dependency ratio, inflation rate, marriage rate etc. Hence, it is expected that insurance penetration also depends on various factors like the demand for insurance.

2. OBJECTIVE OF THE STUDY
Research studies revealed that demand for insurance or consumption of insurance depends on some determinants such as age, income, inflation rate, marriage, and divorce rate, dependency ratio, the population of the country etc.

Insurance Penetration acts as a measurement criterion of the development of insurance sector. So many studies have been conducted in the context of foreign countries but a few studies have been conducted in the context of India. Therefore, it was felt that research study on Insurance penetration would be done highlights the determinants of Insurance Penetration in the Indian context. The objective of the present study is to find out the determinants of Insurance Penetration and measure the effect of those on Insurance Penetration in the context of India.

3. FORMULATION OF HYPOTHESES
The following section is devoted to logical explanation and identification of determinants and hypothesis development.

3.1. Identification of Determinants and Hypothesis Development
Eight important determinants have been considered in the study based on review of literature (1992-2014). These can be established logically in the following ways.

**Inflation**: Inflation rate negatively influences demand of life insurance (Browne and Kim, 1993; Li et al., 2007). Researcher Babbel (1981) reveals that the consumption of life insurance and inflation rate negatively affected with each other. Hence, it is expected that insurance penetration is influenced by the inflation rate. This results of researchers helps to draw the following hypothesis:

**H1**: There is a negative relationship between the inflation rate and penetration of insurance.
FDI Inflow: Long-term economy of any country more depends on FDI inflow than short-term economy (Singh & Gautam, 2014). The total economical growth of any country is affected by FDI in insurance sector (Pawar, 1996). So inflow of FDI positively influences the growth of the economy of any country. It can be concluded that FDI inflow influences the penetration of insurance expected. Regarding this determinant hypothesis can be drawn as follows:

H2: There is a positive relationship between FDI inflow and penetration of insurance.

Education: Research studies reveal that there is a significant and positive relationship between the level of education and the consumption for life insurance (Burnett and Palmer, 1984). Truett and Truett (1990) argued that higher level of education helps the people to aware about all types of life insurance. They easily protect themselves and their dependents. Outreville (1996) argued that a positive relationship exist between higher level education and consumption of life insurance. Life insurance demand is a part of total insurance demand. Hence, it is clear that education influence penetration of insurance. So, a hypothesis regarding penetration of insurance and education can be depicted as follows:

H3: There is a positive relationship between education level and penetration of insurance.

Openness Ratio: Trade openness reflects the export plus import (goods and services) as a share of GDP (UK gov, 2014). Economic growth is positively and significantly affected by this ratio (Balanika, 2006). Development of trade openness indicates an improvement of import and export trade of goods and services. Here, international trading of insurance also relates with openness ratio. So it can be expected that trade openness ratio influences the penetration of insurance. Hence, the following hypothesis can be drawn:

H4: There is a positive relationship between trade openness ratio and penetration of insurance.

Life expectancy: Age i.e. life expectancy of individual positively and significantly related to demand of life insurance (Truett & Truett, 1990). Showers & Shotick (1994) remarked that there is a positive relationship between age and life insurance demand but Hammond et al. (1967) explained the positive and insignificant relationship between these two elements. Berekson (1972) also highlighted the positive and significant relationship between age and demand for life insurance. These studies clearly state that life expectancy of individual influences the penetration of insurance. So hypothesis relating to life expectancy and penetration of insurance can be chalked out as follows:

H5: There is a positive relationship between life expectancy and penetration of insurance.

The productivity of Labour: This determinant represents the relationship between output and per unit of labor input. Labour productivity is a pillar of country’s economic growth (Artige and Nicolini, 2006). The growth of labour productivity helps to generate more income (Conway et.al. 2013). The income level of the individual influences the demand for life insurance. Research studies indicate that there is a positive relationship between income level and demand of life insurance (Mantis and Farmer, 1968; Fortune, 1973; Browne and Kim, 1993). Therefore, life insurance demands indirectly influenced by labour productivity. Hence it can be argued that insurance penetration is also affected by the productivity of labour. The hypothesis regarding the productivity of labour and penetration of insurance can be represented as follows:

H6: There is a positive relationship between productivity of labour and penetration of insurance.

Global Terrorism Index (GTI): ‘Terrorism is the use of violence or threat of violence in order to purport a political, religious, or ideological change’ (Wikipedia). The intention of terrorism activity is being measures through Global Terrorism Index (GTI). According to Fandl (2003) it is an attempt to systematically rank the nations of the world according to terrorist activity. This activity in a country creates a direct negative impact on trade (Nitsch and Schumacher, 2003). Polachek (2004) examines the negative relationship between trade and terrorism activities. It can be concluded that penetration of insurance is negatively affected by Global Terrorism Index. The following hypothesis can be drawn from the above discussion.

H7: There is a negative relationship between Global Terrorism Index and penetration of insurance.
Dependency Ratio: According to Wikipedia ‘dependency ratio is an age-population ratio of those typically not in the labor force (the dependent part) and those typically in the labor force (the productive part). It is used to measure the pressure on productive population’. Higher dependency ratio indicates higher insecurity among individual. So they want to consume more insurance. The hypothesis regarding dependency ratio can be represented as follows.

H8: There is a positive relationship between dependency ratio and penetration of insurance.

4. RESEARCH METHODOLOGY

4.1. Data Collection
This study was conducted based on secondary data i.e., 23 years data (1992 to 2014) for empirically to examine the above hypothesis. Data of this study were gathered from the website of Insurance Regulatory and Development Authority (IRDA) and other related information was gathered from the official website of IMF, ILO etc.

4.2. Measurement of Variables
Here two types of variable are considered, namely dependent variable and independent variable. These are as follows:

Dependent Variable:
Penetration of Insurance is taken as dependent variable. It is the ratio between total premium of insurance and total GDP of a country which signifies the potentiality of the insurance sector.

Independent Variable:
We have considered eight independent variables based on review of literature for this study and eight variables are explained below. These independent variables are calculated in different ways.

4.3. Calculation Techniques of Variables

Inflation: Inflation rate is calculated by using consumer price index. It reflects the annual percentage change of consumer price index to average consumer price index for goods and services that may be changed or fixed. The Laspeyres formula is generally used for calculation of inflation rate.

FDI Inflow: This determinant is calculated as a percentage of total GDP per year i.e. Percentage of FDI inflow equal to the amount of FDI inflow divided by gross domestic product per year (both are measured through US dollar).

Education: Total enrollment in primary education is considered regardless of age, expressed as a percentage of the population of official primary education age. Gross Enrolment Rate can exceed 100%. This is may be happen due to the inclusion of over-aged and under-aged students, because of early or late school entrance and grade repetition.

Openness Ratio: This ratio is calculated by using following formula:

Openness Ratio= (Total Import+ Total Export)/GDP. These three variables are measured by US dollar.

Life expectancy: Life expectancy at birth calculates as the average lifespan of an individual.

The productivity of Labour: It is measured by Output per hour of labour.

The Global Terrorism Index (GTI): According to Wikipedia GTI represents the systematic rank the nations of the world according to terrorist activity. The index combines a number of factors associated with the terrorist attack. It is the product of Institute for Economics and Peace (IEP) and is based on data from the Global Terrorism Database (GTD) which is collected and collated by the National Consortium for the Study of Terrorism and Responses to Terrorism (START) at the University of Maryland. A higher value of this index provides high terrorism activity and vis-à-vis. It varies between zero (0) to one (1).
Dependency Ratio: In this ratio, the dependent part usually includes those under the age of 15 and over the age of 64. The productive part makes up the population in between, ages 15 – 64 (Wikipedia).

Analyses of the Data: Data were analyzed by using SPSS. Descriptive statistics like mean and SD. Inferential statistics like ‘t’ test and multivariate analysis like multiple regression were employed to analyse the data. The results are presented in Table-2,3,4 and 5

Multiple Regression: The following multiple regression formula have been estimated to investigate the impact of the inflation rate, FDI inflow, education, Openness Ratio, Life expectancy, Productivity of Labour, Global Terrorism Index (GTI) and Dependency Ratio on Penetration of Insurance.

\[
\ln P_{in} = \alpha_0 + \alpha_1 \ln I + \alpha_2 \ln FDI_{inf} + \alpha_3 \ln E + \alpha_4 \ln OP + \alpha_5 \ln LE + \alpha_6 \ln PL + \alpha_7 \ln GTI + \alpha_8 \ln DR + \epsilon
\]

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \ln P_{in} )</td>
<td>Log of Penetration of Insurance</td>
</tr>
<tr>
<td>( \ln I )</td>
<td>Log of Inflation Rate</td>
</tr>
<tr>
<td>( \ln FDI_{inf} )</td>
<td>Log of Foreign Direct Investment inflow</td>
</tr>
<tr>
<td>( \ln E )</td>
<td>Log of Education Rate of total population</td>
</tr>
<tr>
<td>( \ln OP )</td>
<td>Log of Openness ratio i.e. (import+Export)/GDP</td>
</tr>
<tr>
<td>( \ln LE )</td>
<td>Log of Life Expectancy Rate</td>
</tr>
<tr>
<td>( \ln PL )</td>
<td>Log of Productivity of Labour</td>
</tr>
<tr>
<td>( \ln GTI )</td>
<td>Log of Global Terrorism Index</td>
</tr>
<tr>
<td>( \ln DR )</td>
<td>Log of Dependency Ratio</td>
</tr>
</tbody>
</table>

5. RESULT ANALYSES

Results of Descriptive Statistics are presented in Table no.- 2. Average Penetration of life insurance of India is 2.2541. Standard deviation is .21509; diversity from mean point is 2.023901 (i.e.2.2541-.21509). It indicates that values of a data set of penetration of insurance are closure to the mean value. Values of other variables vary from one year to another year.

<table>
<thead>
<tr>
<th>Name of the Variables</th>
<th>Mean</th>
<th>SD</th>
<th>Variance</th>
<th>N (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insurance penetration</td>
<td>2.2541</td>
<td>.21509</td>
<td>0.095422</td>
<td>23</td>
</tr>
<tr>
<td>Inflation</td>
<td>.8468</td>
<td>.18580</td>
<td>0.219414</td>
<td>23</td>
</tr>
<tr>
<td>FDI Inflow</td>
<td>.3872</td>
<td>.29844</td>
<td>0.770764</td>
<td>23</td>
</tr>
<tr>
<td>Education</td>
<td>1.9782</td>
<td>.06870</td>
<td>0.034729</td>
<td>23</td>
</tr>
<tr>
<td>Openness</td>
<td>1.5150</td>
<td>.17019</td>
<td>0.112337</td>
<td>23</td>
</tr>
<tr>
<td>Life Expectancy</td>
<td>1.8019</td>
<td>.01787</td>
<td>0.009917</td>
<td>23</td>
</tr>
<tr>
<td>Productivity of labour</td>
<td>.5846</td>
<td>.25664</td>
<td>0.439001</td>
<td>23</td>
</tr>
<tr>
<td>Global Terrorism index</td>
<td>.8781</td>
<td>.01869</td>
<td>0.021285</td>
<td>23</td>
</tr>
<tr>
<td>Dependency ratio</td>
<td>1.7908</td>
<td>.03901</td>
<td>0.021784</td>
<td>23</td>
</tr>
</tbody>
</table>

The coefficient of variance represents the consistency of a data set. It indicates a reverse relationship with consistency. A Large value of variance highlights lower consistency and vis-à-vis. Among the sample determinants, data of Life Expectancy is more consistent (0.009917) and lower consistency exists in the data set of FDI inflow (0.770764) during the sample period.
A Study on Determinants of Insurance Penetration in the Context of India

Table 3 Result of Regression and t test

<table>
<thead>
<tr>
<th></th>
<th>Beta</th>
<th>‘ t’ test</th>
<th>Level of Significance.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>.557</td>
<td>.586</td>
<td>.586</td>
</tr>
<tr>
<td>Inflation</td>
<td>.047</td>
<td>.359</td>
<td>.725</td>
</tr>
<tr>
<td>FDI Inflow</td>
<td>.101</td>
<td>.693</td>
<td>.500</td>
</tr>
<tr>
<td>Education</td>
<td>.302</td>
<td>.926</td>
<td>.370</td>
</tr>
<tr>
<td>Openness*</td>
<td>1.222</td>
<td>3.617</td>
<td>.003*</td>
</tr>
<tr>
<td>Life Expectancy</td>
<td>-1.121</td>
<td>-.600</td>
<td>.558</td>
</tr>
<tr>
<td>Productivity of labour</td>
<td>-.085</td>
<td>-.693</td>
<td>.500</td>
</tr>
<tr>
<td>Global Terrorism index</td>
<td>-.099</td>
<td>-.867</td>
<td>.400</td>
</tr>
<tr>
<td>Dependency ratio</td>
<td>-.719</td>
<td>-.438</td>
<td>.668</td>
</tr>
</tbody>
</table>

Effect of intercept is 0.557 which indicate that when the impact of all sample determinants is nil then a relationship with other non-sample determinants will positive and value will be 0.557. In the regression equation of all determinants have an effect on penetration of life insurance but only one determinant (Openness ratio) has an only significant impact on life insurance penetration. The impact of education rate is .302 signify that 1% change in education, influence 30.2% change in penetration of life insurance and so on.

Table 4 Model Summary

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.965*</td>
<td>.931</td>
<td>.891</td>
<td>.07086</td>
</tr>
</tbody>
</table>

Hence, adjusted R² is 93.1% indicates a good fit of the regression equation. Table no 4 represents this result. Another side, it is identified that sample determinants have more significant effect on penetration of life insurance rather than other determinants which are represented by following ANOVA in Table No.5

Table 5 ANOVA

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>.948</td>
<td>8</td>
<td>.118</td>
<td>23.589</td>
<td>.000b</td>
</tr>
<tr>
<td>Residual</td>
<td>.070</td>
<td>14</td>
<td>.005</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1.018</td>
<td>22</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Regression value of this study is 0.948 which covers 93.12% (Approx) of total value and residual value is .070 i.e. 6.89% (Approx) of total value which depicts more accurate determinants of study.

6. CONCLUSION

This study is conducted on the penetration of insurance in India over 23 year’s data (1992 to 2014). The result of this study shows that only one hypothesis on Openness is about significant at .003 level and remaining hypotheses are rejected. Enhancement of Foreign Direct Investment inflow, Education, and Openness Ratio show positive value for the growth of Insurance Penetration whereas Global Terrorism Index negatively affects the development of Insurance sector as per expectation. The result of Life expectancy indicates that the dependency on insurance sector reduces if average survival capacity of human being increases. Regarding dependency ratio, it can be concluded that improvement of dependency reduces real income per capita which creates a negative impact on the development of Insurance Penetration. The positive impact of inflation rate may represent that at the time of inflation people are suffered by fear psychosis about their future and they want to invest more amounts in Insurance sector.
Labour productivity has a negative effect on penetration of insurance which indicates more productive labour want to invest money other than insurance sector.

7. IMPLICATION OF THE STUDY

Insurance penetration implies the contribution of insurance sector on Gross Domestic Product. It also discloses the progressing position of this service sector. Present study tries to highlight the impact of eight elements on insurance penetration in India. It helps to depict the positive impact of Foreign Direct Investment, Education, Openness Ratio and negative impact of Global Terrorism Index.

This research work directly represents demand of insurance sector in India and indirectly focuses on strength of insurance sector and cultural values of country (whether accept or reject insurance product). Enhancement of Insurance education, development of export-import business growth and foreign direct investment influences insurance penetration another side terrorism activity neglects the development of insurance penetration.

This study helps to add a new away in insurance sector research. Researchers, student, various companies, educational institutions, government can be beneficial from this research work. Besides, market researchers, data analysts. Data scientists to eliminate and evaluate the best set of variables to be used for building predictive model.

This study highlights all determinants have effects on Penetration of Insurance. It would be better to take the study with the bigger sample in terms of country, variables and period before generalization of the result.

REFERENCES

A Study on Determinants of Insurance Penetration in the Context of India


