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### Analysis of penetration and density of the Indian insurance industry

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#### Abstract

At present, India's insurance industry rank tenth in the world and it is expected that by the end of the year 2032, the insurance industry will attain the sixth position in the world. Analysis of insurance density and penetration is essential to assess the progress of insurance business of any country. The present study is based on secondary data and the data was collected from the annual reports of IRDAI. For the purpose of analysis three groups were made of the selected companies. First group represented the Insurance Industry, the second group was life insurers and the third was made of non-life insurance companies. Growth and trend analysis of twenty one years from 2001-02 to 2021-22 had been done to compare the growth of the selected companies. Further, to test the validity of the hypothesis, ANOVA has been used on SPSS. The study revealed the significant difference in the mean score of all three groups. During the research, it was found that the density and penetration both have significantly increased.

**Keywords:** Insurance, insurance density (ID), insurance penetration (IP), IRDAI

#### Introduction

In the economic development of any country, the insurance industry plays a significant role as it provides insurance cover against risk arises from the uncertainty in life and non-life properties. It not only provide cover against uncertainties, but it also generates employment. The COVID-19 pandemic has further increased the potential for life insurance business and health insurance business in India.

At present there are twenty four life insurance companies, twenty eight general insurance companies and five health insurance companies operating in the country. "As per Swiss Re data India rank was tenth in global insurance business with a market share of 1.85 percent in 2021. In life insurance business, India ranked ninth in the world and in non-life insurance business India was ranked fourteenth in the world" [1].

As per the IRDAI annual report, primary factors of premium growth in the year 2022 were financial market condition, economic uncertainties and inflationary pressure. Protection providing product demand increased due to increase in the life risk awareness post pandemic and change in business models by the insurance companies by providing more products & services digitally. According to Debasish Panda, Chairman IRDAI, India needs to invest additional rupees fifty thousand crores every year to double the penetration and these additional funds will be invested by the existing insurance companies through reinvesting their profits & raising some additional capital [2].

For the evaluation of development of the insurance industry in the country, insurance density and penetration are two main metrics. High insurance penetration shows the progress of the insurance business in the country, as well as it also tells how popular insurance is among the common citizens of the country. India's insurance penetration rate is very low in comparison to the global market and we find ourselves far behind. To increase the insurance penetration rate and density analysis of these two play significant roles.

<sup>1</sup> <https://irdai.gov.in/document-detail?documentId=1632108>

<sup>2</sup> <https://www.newindianexpress.com/business/2023/jan/21/insurance-industry-needs-rs-50000cr-investment-per-year-says-irda-2539936.html>

**Review of Literature**

Vimala & Alamelu (2018) [9] analysed in their research insurance density and penetration of India’s insurance business from 2010 to 2017. They used secondary data collected from the annual reports of IRDAI. For the purpose of analysis and test significance, ANOVA has been used. The research revealed that mean value of the insurance industry, life insurance companies and non-life insurance companies differ significantly. They made it clear through his research that to increase the insurance density and insurance penetration in the country, emphasis should be given on the development of insurance business in rural areas.

Dubey Anil (2018) [3] analysed insurance growth in India on the basis of insurance penetration and premium income. According to research, insurance business can be increased through new insurance channels; especially efforts should be made to reach insurance products in rural areas. After the liberalization of the insurance business, there has been a positive progress in the insurance business in the country, especially due to the competitive market, there has been an increase in the post-insurance facilities to the customers.

Kshetrimayum Sobita Devi (2011) [4], in her research paper, the author has shown the effects of privatization as well as how private insurance companies have participated in the development of insurance business. The time period of the research is 10 years (1999 – 2009). This period has been clarified through analysis, that there is a direct correlation between insurance density and GDP.

Dhar Pranam (2018) [2], study shows that there has been an

increase in total premium income, first year premium income, single premium income and renewal premium income. This increase is seen not only in LIC but also in the income of private insurance companies. After the advent of private insurance companies market share of LIC has definitely decreased but still LIC is giving tough competition to private companies in terms of issuing new policies. In addition, private insurance companies are paying more as salaries, as a result of which their operating expense edge is increasing.

Kaur Jaspreet (2015) [6], examined market share of insurance companies operating in India along with the study of insurance density and penetration. Researcher had used secondary data collected from the annual reports of the IRDAI. She concluded that after deregulation of insurance business, significant change has been observed in the industry in terms of providing services and offering products.

**Objective of the study**

The objective of this research paper is to analyse the insurance density and penetration of the selected companies along with the study of growth rate and trends of the insurance penetration and density in India during the research period.

**Hypotheses**

In the study it is assumed that mean of insurance density and penetration of the selected companies was equal and the following two null hypotheses were made

$$H_0^1: \mu_{\text{Insurance Density}}^{\text{Insurance Industry}} = \mu_{\text{Insurance Density}}^{\text{Life Insurance Companies}} = \mu_{\text{Insurance Density}}^{\text{Non-Life Insurance companies}}$$

$$H_0^2: \mu_{\text{Insurance Penetration}}^{\text{Insurance Industry}} = \mu_{\text{Insurance Penetration}}^{\text{Life Insurance Companies}} = \mu_{\text{Insurance Penetration}}^{\text{Non-Life Insurance companies}}$$

**Methodology**

The present study is based on secondary data and the data was collected from the annual reports of IRDAI. For the purpose of analysis three groups were made of the selected companies. First group (Group-1), represented Insurance Industry, second group (Group-2), life insurers and the third group (Group-3), was made of non-life insurance companies. Growth and trend analysis of twenty one years from 2001-02 to 2021-22 had been done to compare the growth of the selected companies. Further, to test the validity of the hypothesis, ANOVA has been used on SPSS.

**Data analysis and interpretation**

Insurance density and penetration are considered two important factors for measuring the progress of insurance business in any country. Following are the formulas to calculate insurance density and penetration ratios.

“Insurance density is measured as ratio of premium (in USD) to total population” [3].

$$\text{Insurance Penetration Ratio} = \frac{\text{Premium underwritten (in US\$) in a given year}}{\text{Total Population}} \times 100$$

“Insurance penetration is measured as ratio of premium (in USD) to GDP (in USD)” [3].

$$\text{Insurance Density Ratio} = \frac{\text{Premium underwritten (in US\$) in a given year}}{\text{Gross Domestic Product}} \times 100$$

The table number one shows the data related to the insurance density and penetration of the India’s Insurance industry.

3 <https://irdai.gov.in/document-detail?documentId=1632108>

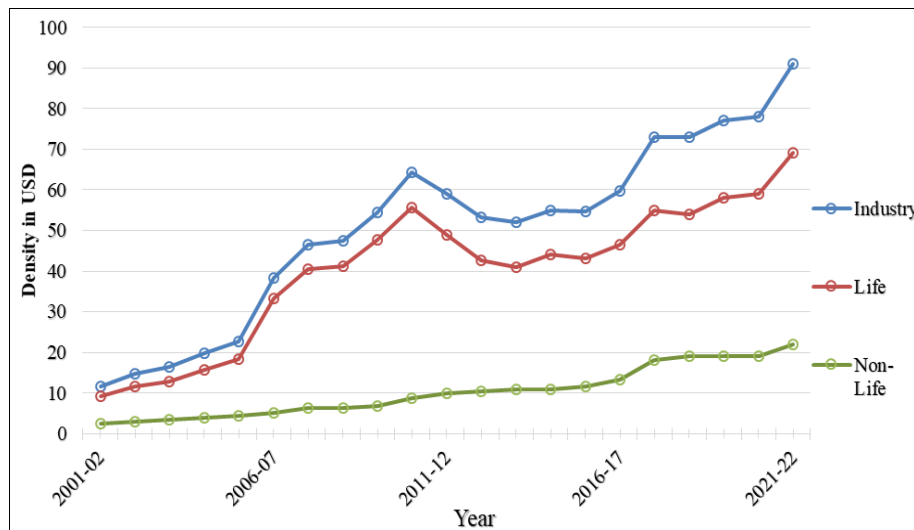
**Table 1:** Insurance Density and Penetration in India

Year	Group-1		Group-2		Group-3	
	ID in \$	IP in %	ID in \$	IP in %	ID in \$	IP in %
2001-02	11.5	2.71	9.1	2.15	2.4	0.56
2002-03	14.7	3.26	11.7	2.59	3.0	0.67
2003-04	16.4	2.88	12.9	2.26	3.5	0.62
2004-05	19.7	3.17	15.7	2.53	4.0	0.64
2005-06	22.7	2.96	18.3	2.35	4.4	0.61
2006-07	38.4	4.70	33.2	4.10	5.2	0.60
2007-08	46.6	4.60	40.4	4.00	6.2	0.60
2008-09	47.4	4.60	41.2	4.00	6.2	0.60
2009-10	54.4	5.20	47.7	4.60	6.7	0.60
2010-11	64.4	5.11	55.7	4.40	8.7	0.71
2011-12	59.0	4.10	49.0	3.40	10.0	0.70
2012-13	53.2	3.95	42.7	3.17	10.5	0.78
2013-14	52.0	3.90	41.0	3.10	11.0	0.80
2014-15	55.0	3.30	44.0	2.60	11.0	0.70
2015-16	54.7	3.44	43.2	2.72	11.5	0.72
2016-17	59.7	3.49	46.5	2.72	13.2	0.77
2017-18	73.0	3.69	55.0	2.76	18.0	0.93
2018-19	73.0	3.71	54.0	2.74	19.0	0.97
2019-20	77.0	3.76	58.0	2.82	19.0	0.94
2020-21	78.0	4.20	59.0	3.20	19.0	1.00
2021-22	91.0	4.20	69.0	3.20	22.0	1.00

Source: Annual Report of IRDAI

As it was clear from the above table that from the year 2001-02 to 2010-11, insurance density had increased in both groups, Group-2 and Group-3 companies. There had been a decrease in insurance density in the country from the year

2012 to 2016 but after that a steady increase has been seen till the year 2022. In the year 2021-22 the insurance density in the life insurance sector was US\$ 69 while in the Non-life insurance sector it was US\$ 22.



**Chart 1:** Insurance Density in India

If we talk about insurance penetration, then from the year 2002 to 2011, a continuous increase has been registered in it. Insurance penetration in the country was 5.20% in the year 2009-10, which is the highest till date. From the year 2012 to 2015, there was a decline in insurance penetration,

but after that a steady increase in insurance penetration was recorded during the research period. Insurance penetration in the country of the life and non-life sectors was 3.2% and 1% respectively in the year 2022.

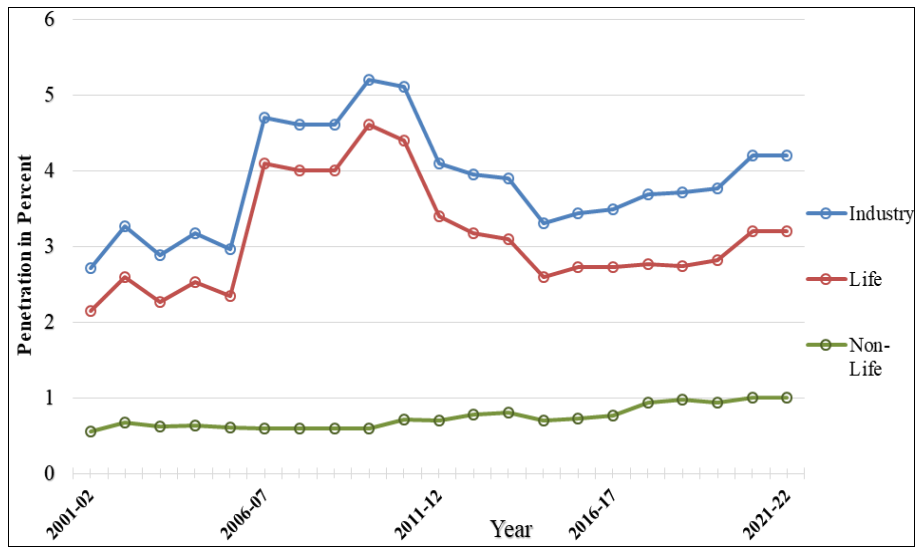


Chart 2: Insurance Penetration in India

Table 2: Growth Rate Insurance Density and Penetration in India

Year	Group- 1		Group- 2		Group- 3	
	ID in \$	IP in %	ID in \$	IP in %	ID in \$	IP in %
2002-03	27.83	20.30	28.57	20.47	25.00	19.64
2003-04	11.56	-11.66	10.26	-12.74	16.67	-7.46
2004-05	20.12	10.07	21.71	11.95	14.29	3.23
2005-06	15.23	-6.62	16.56	-7.11	10.00	-4.69
2006-07	69.16	58.78	81.42	74.47	18.18	-1.64
2007-08	21.35	-2.13	21.69	-2.44	19.23	0.00
2008-09	1.72	0.00	1.98	0.00	0.00	0.00
2009-10	14.77	13.04	15.78	15.00	8.06	0.00
2010-11	18.38	-1.73	16.77	-4.35	29.85	18.33
2011-12	-8.39	-19.77	-12.03	-22.73	14.94	-1.41
2012-13	-9.83	-3.66	-12.86	-6.76	5.00	11.43
2013-14	-2.26	-1.27	-3.98	-2.21	4.76	2.56
2014-15	5.77	-15.38	7.32	-16.13	0.00	-12.50
2015-16	-0.55	4.24	-1.82	4.62	4.55	2.86
2016-17	9.14	1.45	7.64	0.00	14.78	6.94
2017-18	22.28	5.73	18.28	1.47	36.36	20.78
2018-19	0.00	0.54	-1.82	-0.72	5.56	4.30
2019-20	5.48	1.35	7.41	2.92	0.00	-3.09
2020-21	1.30	11.70	1.72	13.48	0.00	6.38
2021-22	16.67	0.00	16.95	0.00	15.79	0.00

From table two, it can be observed that the growth rate of insurance density was the highest 69.19 in the year 2006-07 and it was lowest (-9.83) in the year 2012-13. It can be interpreted from the above table that the growth rate of insurance density during COVID-19 had been very low. Insurance density growth rate in the year 2021-22 had been recorded at 16.95% in life insurance business, 15.79% in non-life insurance business and 16.67% in the insurance industry which shows good signs for insurance business

post pandemic. If we talk about the insurance penetration growth rate, then in the year 2020-21, life insurance companies growth rate of 13.48% had been registered whereas for the same period non-life insurance companies growth rate was 6.38%. The year 2021-22 had not been good for the insurance industry as zero growth rate of insurance penetration was recorded in all three groups of companies.

Table 3: Trend of Insurance Density and Penetration in India

Year	Group- 1		Group- 2		Group- 3	
	Density	Penetration	Density	Penetration	Density	Penetration
2001-02	15.88	3.59	15.25	3.06	0.71	0.53
2002-03	19.35	3.62	17.76	3.06	1.66	0.55
2003-04	22.82	3.64	20.27	3.07	2.61	0.57
2004-05	26.29	3.67	22.78	3.07	3.56	0.59
2005-06	29.75	3.69	25.29	3.08	4.51	0.61
2006-07	33.22	3.72	27.80	3.08	5.46	0.63
2007-08	36.69	3.75	30.31	3.09	6.41	0.65
2008-09	40.16	3.77	32.82	3.09	7.36	0.68

2009-10	43.63	3.80	35.33	3.10	8.31	0.70
2010-11	47.09	3.82	37.84	3.10	9.26	0.72
2011-12	50.56	3.85	40.35	3.11	10.21	0.74
2012-13	54.03	3.88	42.86	3.12	11.16	0.76
2013-14	57.50	3.90	45.37	3.12	12.11	0.78
2014-15	60.97	3.93	47.88	3.13	13.06	0.80
2015-16	64.43	3.95	50.39	3.13	14.01	0.82
2016-17	67.90	3.98	52.90	3.14	14.96	0.84
2017-18	71.37	4.01	55.41	3.14	15.91	0.87
2018-19	74.84	4.03	57.92	3.15	16.86	0.89
2019-20	78.31	4.06	60.43	3.15	17.81	0.91
2020-21	81.77	4.08	62.94	3.16	18.76	0.93
2021-22	85.24	4.11	65.45	3.16	19.71	0.95

Table number three shows the trends in insurance penetration and density. It was observed from the above table that insurance industry density trend value was 15.88 in the year 2001-21 which has increased to 85.24 in the year 2021-22. Similarly increasing trend was visible in the other two groups, life insurance companies and non-life insurance companies.

As far as trend value of insurance penetration is concerned then like insurance density, increasing trend is clearly visible in trend of insurance penetration. It is clear from table number three that from the year 2001-02 to 2021-22 the trend value has increased continuously. So it can be said that in near future also similar increasing train will be seen in insurance business which shows bright future of insurance business in India.

**Statistical testing of first hypothesis**

The given statistical testing measures the validity of the hypothesis whether mean score of insurance density of selected companies differ with each other. The ANOVA result suggested that the mean density of the companies differs significantly ( $F_{32.358}, p < 0.001$ ). Levene’s test has been conducted to know whether variances of the given groups were same or they differ with each other. Since the Levene’s statistic was significant, therefore equal variance was assumed.

Further to check the individual differences between Insurance Industry (Group-1), Life Insurance Companies (Group-2) and the Non-Life Insurance Companies (Group-3), Post-Hoc comparisons were assessed by using Tukey’s HSD. The test indicated that mean score of density for the

Insurance Industry ( $M=50.5619, S.D. = 22.78384$ ) was significantly different from Non-Life Insurance Companies ( $M=10.2143, S.D. = 6.10592$ ). The mean score of Life Insurance Companies ( $M=40.3476, S.D. = 17.33112$ ) was significantly different from Non-Life Insurance Companies ( $M=10.2143, S.D. = 6.10592$ ). However no significant differences were detected between Insurance Industry & Life Insurance Companies.

**Table 4:** Descriptives: Density

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean
					Lower Bound
Insurance Industry	21	50.5619	22.78384	4.97184	40.1908
Life Insurance Companies	21	40.3476	17.33112	3.78196	32.4586
Non-Life Insurance Companies	21	10.2143	6.10592	1.33242	7.4349
Total	63	33.7079	23.96807	3.01969	27.6717

**Table 5:** Test of Homogeneity of Variances: Density

Levene Statistic	df1	df2	Sig.
8.755	2	60	.000

**Table 6:** ANOVA- Density

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	18481.958	2	9240.979	32.358	.000
Within Groups	17135.068	60	285.584		
Total	35617.026	62			

**Table 7:** Post Hoc Tests: Multiple Comparisons

Dependent Variable: Density Tukey HSD				
(I) Insurance Industry, Life Insurance Companies and Non-Life Insurance Companies	(J) Insurance Industry, Life Insurance Companies and Non-Life Insurance Companies	Mean Difference (I-J)	Std. Error	Sig.
Insurance Industry	Life Insurance Companies	10.21429	5.21522	.131
	Non-Life Insurance Companies	40.34762*	5.21522	.000
Life Insurance Companies	Insurance Industry	-10.21429	5.21522	.131
	Non-Life Insurance Companies	30.13333*	5.21522	.000
Non-Life Insurance Companies	Insurance Industry	-40.34762*	5.21522	.000
	Life-Insurance Companies	-30.13333*	5.21522	.000

**Statistical testing of Second hypothesis**

The given statistical testing measures the validity of the hypothesis whether mean score of insurance penetration of selected companies differ with each other. The ANOVA result suggests that the mean score of penetration of the companies differs significantly ( $F_{160.494}, p < 0.001$ ). Levene’s test was conducted to know whether variances of

the given groups were same or they differed with each other. Since the Levene’s statistic was significant, therefore equal variance was assumed.

Further to check the individual differences between the groups, Post-Hoc comparisons were assessed by using Tukey’s HSD. The test indicated that mean score of penetration for the Insurance Industry ( $M=3.8538,$

S.D.=0.70971) was significantly different from Life Insurance Companies (M=3.1148, S.D.=0.71723) and Non-Life Insurance Companies (M=9.7390, S.D.=0.14693). The

mean score of Life Insurance Companies (M=3.1148, S.D.=0.71723) was significantly different from Non-Life Insurance Companies (M=0.7390, S.D.=0.14693).

**Table 8:** Descriptives: Penetration

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean
					Lower Bound
Insurance Industry	21	3.8538	.70971	.15487	3.5308
Life Insurance Companies	21	3.1148	.71723	.15651	2.7883
Non-Life Insurance Companies	21	.7390	.14693	.03206	.6722
Total	63	2.5692	1.45933	.18386	2.2017

**Table 9:** Test of Homogeneity of Variances: Penetration

Levene Statistic	df1	df2	Sig.
12.968	2	60	.000

**Table 10:** ANOVA- Penetration

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	111.244	2	55.622	160.494	.000
Within Groups	20.794	60	.347		
Total	132.038	62			

**Table 11:** Post Hoc Tests: Multiple Comparisons

Dependent Variable: Penetration Tukey HSD				
(I) Insurance Industry, Life Insurance Companies and Non-Life Insurance Companies	(J) Insurance Industry, Life Insurance Companies and Non-Life Insurance Companies	Mean Difference (I-J)	Std. Error	Sig.
Insurance Industry	Life Insurance Companies	.73905*	.18168	.000
	Non-Life Insurance Companies	3.11476*	.18168	.000
Life Insurance Companies	Insurance Industry	-.73905*	.18168	.000
	Non-Life Insurance Companies	2.37571*	.18168	.000
Non-Life Insurance Companies	Insurance Industry	-3.11476*	.18168	.000
	Life-Insurance Companies	-2.37571*	.18168	.000

## Suggestions

India global rank in the Insurance industry can be improved in next five years. Following are the few suggestions which may help in growth of insurance industry penetration and density in India.

1. A large part of India's country's population is illiterate, due to illiteracy; most of the people lack financial skills. As a result, these citizens do not know how they can reduce their financial risk by using insurance products. Therefore, Insurance business can be increased by improving the educational level in the country.
2. Most of the insurance agents limit their work to urban areas, while a large part of India's population lives in rural areas, so insurance density can be increased in the country by connecting the country's rural population with the insurance business.
3. Digitization has increased continuously in the country since the COVID-19 epidemic. Now these days smartphones have reached every household in the country, in such a situation; insurance products can be made available to the common people at minimum cost.
4. After the Covid-19 pandemic, most of the citizens have become aware of their health, in such a situation, the insurance business can be increased in the country through the health insurance business.

## Conclusion

Indeed it is often witnessed that Insurance industry is steadily progressing over the past two decades. During the analysis it was found that there was a significant difference

in the mean score of insurance penetration (IP) of all three groups. The study also reveals the facts that mean scores of insurance density (ID) also significantly differ from each other. Despite the fact that both life insurance and non-life insurance businesses are growing with the innovation in their products, still Non-Life Insurance business is lagging behind as compared to the Life Insurance Business. Since the Insurance penetration seems to be lower in the rural area as compared to the urban area therefore it is necessary to be expanded in the rural area. It is due to the fact that people residing in the rural area have no awareness about such schemes. Hence it is essential to make necessary efforts so as to make them aware about these Insurance Schemes.

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