

Investigating the Affective Factors on Development of Life Insurance among OECD Chosen Countries Compared to Iran

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ABSTRACT

Life insurance is regarded as the useful legal instruments which have been little captured by the public in the country. The exploration into the historical background of this legal institution indicates that the life insurance is among the first centers to be used in Iran; however, its development has experienced a slower pace compared to other similar insurances. Hence, the present study strives to explore the contributive factors to development of life insurance in developing countries for the years 2002 to 2011. The obtained results show that among the studied variables for developing countries, urbanization, dependent rate, life expectancy, inflation and growth of population have been the most contributive elements. In addition, for Iran country population growth, rate of dependency and inflation are among the most affective factors.

KEYWORDS: dependent rate, annual income, life expectancy, urbanization, life insurance industry

INTRODUCTION

The neoclassic development theory from economic point of view states that technological-based economics make progressions only when stale. This is regarded as a small portion of concern in government in relation to motivating and making incentive manner for economic development, the reviews in this field have indicated the way investment is able to bring about positive fashion for developing other economic fields. The questions rise when considering the affective types of insurances. It has been attempted in the present study to investigate all economic and social variables contributing to life insurance, it is essential to note that the role of financial development is significant in economic growth. The result of conducted studies show that establishing financial and insurance institutes leads to improving efficiency, devoting investment and effective resources, motivating saving and increasing the investment (Fischer, 1973).

Regarding the notion that the insurance industry is taken into account as the main component of economy due to the incoming insurance payments, increasing the share in producing non-oil production and involved amount of investment within it. So, it is not surprising to say that increasing the demand of insurance to financial development would assist in a number of ways in this regard (Truett, 1990).

Statement of the problem

Human kind is a vulnerable living creature and is exposed to several risks throughout the life which impedes him from predicting such events. It is clear that any anxious and curious humankind seeks for concerns in order to provide safety for himself and people around. When such a relaxing fashion is established in his mind, the efficiency increases subsequently. Since life insurance bring about relaxing status, it is possible to claim that it has important impacts on people's welfare and development of economy in the country. Currently, insurance industry is regarded as the most common economic-based organizations which support strongly other relevant economic-associated centers as well as the families. Life insurances are highly appreciated entire the role. Unfortunately, the role of life insurances has been neglected by developing countries especially that of Iran. Considering the importance of life insurance and lack of its development in developing countries, the present study endeavors to compare the effective factors in relation to life insurance industry among developing countries and Iran using new experimental methods.

Review of literature

Beck and Weber (2003) investigated the effect of macroeconomic variables such as gross domestic product, real rate of interest, rate of inflation and other descriptive variables on demand of life insurance through making use of panel method and collected data in different periods for 68 economics during 1961 to 2000. They concluded that gross domestic production of life expectancy, inflation and bank-related section were the most affective factors on demanding life insurance.

Kim and Hoberman (2004) explored the effect of macroeconomic variables such as financial development, income, and inflation, rate of interest and price as well as statistical variables such as pure rate of death and birth and life expectancy on demanding life insurance through making use of time series data for the

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year 1968-2001. The results manifested that pure rate of death and changes in total rate of birth were the two significant statistical variables in increasing life insurance demand.

Cogler and Ofogi (2005) concluded based on convergent test of Yohanson and collected data for the year 1971-2003 that life insurance supported short-term and long-term economic development. Hence, one is able to accelerate the economic development through identifying the contributive factors to life insurances in short run.

Sen (2007) showed a number of contributive economic and demographic variables to life insurance demand among Asian chosen countries. The results depicted that the increase of saving and income would lead to increase in purchasing life insurances and real rate of interest. Also, demographic variables such as life expectancy, dependent rate among adults and aged people, level of education and rate of urbanization were identified to be affective variables on demanding life insurance.

Nortlib (2010) examined the relationship between macroeconomic variables including annual income, rate of inflation, product price, rate of saving, rate of constant deposits, rate of unemployment and demanding life insurance in order to obtain a specific strategy for selling life insurance through making use of time series data for the years 1998-2008 in Malaysia. The findings revealed that only annual income, rate of saving and rate of constant deposits were correlated with demanding life insurance.

Regarding the view that life insurance is one of the important financial series which is able to establish a growth in economics through long-term saving and providing safety, Mitra and Goosh (2010) tried to investigate the contributive factors to life insurance demanding, the results indicated that income and financial development were the most significant positive factors to leading life insurance while rate of interest was found to be negatively correlated with other alternative investment in relation to demanding life insurance.

Estimating the function of life insurance demand in Iran using time series data for the year 2004, Porpartovi (2003) predicted the amount of its demand through making use of predictive sample and it was concluded that the most important determining factors were income, the level of education, depend rate and inflation expectation.

Using OLS rate method, Jalali Lavasani (2005) investigated the effect of variables including national income, price index, unemployment, depend rate, level of education and payoff damages by insurance on individual insurances for the year 1971. The results reported that the effect of national income, the index of consumer price and rate of unemployment on demanding individual insurances were significant, however, depend rate and educated level had a little impact on demanding individual insurances.

Data analysis

Reliability of variables

In order to study the contributive factors to developing life insurance industry in developing countries and Iran, the research made use of linear sample and panel data. Prior to estimating assumed sample, the variables should be assessed in terms of reliability due to the fact that unreliability fashion of variables both for time series data and panel data would lead to fake regression. As mentioned in previous chapter, the root of units show that time series does not lead to convergent long run route and its variance is dependent on time in a way that when the time leads to infinite, the variance of time series leads to infinite, too. The results of variables reliability are investigated based on the attributes of the present study data. According to Maddala and Wu (1999, 635), the appropriate test to be administered in the present study is as follows: Im-Pesaran-Shin test and Fisher type test. It is worth noting that the null hypothesis is taken into account as the inclusion of united root and alternative hypothesis is said to be depend on the lack of unite root existence.

Table 1. The results of testing reliability of variables (Im, Pesaran and Shin W-stat) test statistics

No	variables	Probability in non-trend case and intercept	result	Probability with one time difference of non-trend case and intercept	result
1	Pen	0.3517	Non-constant	0.0010	constant
2	rgdp	0.3056	Non-constant	0.0856	constant
3	popg	0.0000	constant		
4	dep	0.0000	constant		
5	urb	0.0000	constant		
6	inf	0.0001	constant		
7	ep	0.1000	Non-constant	0.0007	constant

The results of Im, Pesaran and Shin test are used for model variable on non-differential and differential cases without intercept and on –trend fashion. Based on the compared calculated values and critical values of the

table, all variables are constant but pen, rgdp and ep. These variables are converted to constant when differentiate-excluded.

Table 2. The results of testing reliability of variables (PP- Fisher Chi-square statistic)

No	variables	Probability in non-trend case and intercept	result	Probability with one time difference of non-trend case and intercept	result
1	Pen	0.0678	constant		
2	rgdp	0.1082	Non-constant	0.0000	constant
3	popg	0.3503	Non-constant	0.0000	constant
4	dep	0.3635	Non-constant	0.0000	constant
5	urb	0.0000	constant		
6	inf	0.0000	constant		
7	ep	0.3635	Non-constant	0.0000	constant

The results of Philips Prone test are used for model variable on non-differential and differential cases without intercept and on –trend fashion. Based on the compared calculated values and critical values of the table, all variables are constant but ep, dep, popg and rgdp. These variables are converted to constant when differentiate-excluded.

Cointegration test

Variables are said to be cointegrated when their linear composition is stable. In fact, most of the time series are non-stable, but they follow a similar trend which indicates that they have been limited in the lng-term. So, cointegrated relationship can reflect the long-term relationship or balanced-based phenomena among the time series and it is feasible that they deviate from the line and make reverse movement, so, if regression equation of u_t is stable it means that the trend of descriptive variables implies the existence of balanced equation and the possibility of fake regression 3 is rejected. In order to study the cointegrity of panel time series, the research made use of KAO method and generalized Dikifolker test. Also, to study the cointegrity of time series for Iran, the research utilized Johanson method and effect and maximum special value tests.

Table 3. Cointegrity tests of PEN RGDP POPG DEP URB INF EP series based on Kao Residual Cointegration test

Test	t-statistic	probability	result
Augmented Dickey-Fuller Test	-3.207439	0.0007	The assumed series is cointegrated

The results of the above tables show that the series is cointegrated.

Multicollinearity test among the variables

Linear correlation among the variables which is called multicollinearity causes among two descriptive variables that the correlation coefficient(r_{23}) is increased and this leads to increase in their estimating variance. The increase of variances results in widening the interval of confidence among the parameters. On the other hand, since the variance of estimators increases, the coefficient are converted to non-significance fashion and their t is sometimes reduced. The increase of (r_{23}) gives rise to the covariance value among the estimating coefficients./ so, in case of highly multicollinearity, the covariance of estimators get increased and the inclusion or exclusion of one variables makes changes in the coefficient values. In other words, the estimation of parameters is highly dependent on one another and one is not able to estimate the exact values of this parameter. In order to study the multicollinearity among the assumed variables, the correlation matrix is formed. One of the simple criteria to identify the multicollinearity is to use the correlation coefficients among descriptive variables in the form of correlative matrix based on table 4. If the correlation coefficients among the descriptive variables are relatively high, it means a rather high multicollinearity. If the correlation coefficient is low, it does not mean that there is no multicollinearity. In other words, it is possible that there is rather high multicollinearity in the model despite the fact that the coefficients are low. Based on the results of correlative matrix, it is seen in table 4 that all coefficients are related to 0.7 value which is ignorable.

Table 4. Correlation matrix

	PEN	RGDP	POPG	DEP	URB	INF	EP
PEN	1.000000	0.224597	0.074022	0.000418	0.160493	-0.301794	0.359099
RGDP	0.224597	1.000000	-0.096795	0.112291	0.140513	-0.153592	0.054266
POPG	0.074022	-0.096795	1.000000	0.097841	-0.176948	-0.034876	-0.090967
DEP	0.000418	0.112291	0.097841	1.000000	0.431908	0.121402	0.333821
URB	0.160493	0.140513	-0.176948	0.431908	1.000000	-0.029812	0.524453
INF	-0.301794	-0.153592	-0.034876	0.121402	-0.029812	1.000000	-0.243961
EDU	0.170235	0.257649	-0.318754	-0.319563	0.196272	-0.138781	0.252190
EP	0.359099	0.054266	-0.090967	0.333821	0.524453	-0.243961	1.000000
RINS	-0.234320	-0.089083	-0.214758	-0.151034	0.166012	-0.366057	0.007953

In order to study the collinear fashion in the time series method in Iran among the independent variables, VIF is used (Mohamadzade, 2010). The findings of the study carried out by Chatrji and Prais (1991) have indicated that if the value of VIF for independent variable is greater than 10, it shows a collinear fashion. The results of the above table show that all VIFs are less than 10 which show the optimum status of correlation among the variables.

Table 5. VIF test for variables

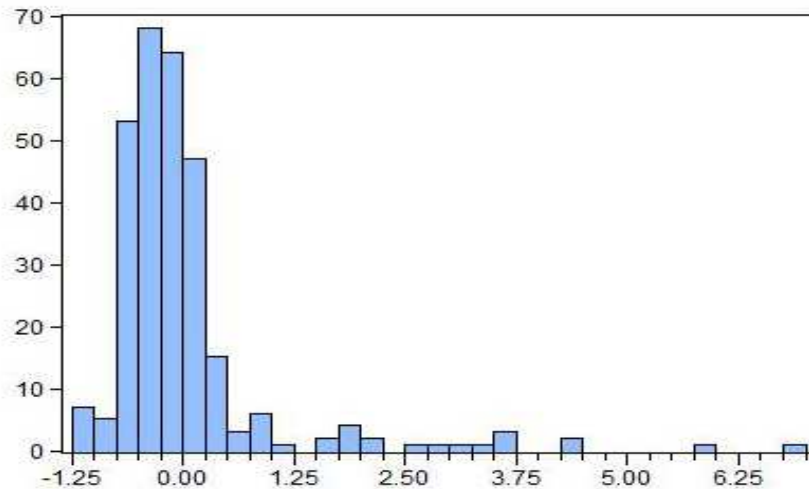
variables	Value VIF
pen	Dependent variable
ep	1.61
urb	1.49
dep	1.33
inf	1.33
rgdp	1.33
popg	1.02

One of the classics assumptions is the normality of error term. If the random variable Z has a standard normal distribution, its mean and variance are zero and 1, respectively. So, the error term is distributed symmetrically around its mean. Each standard normal distribution is symmetric i.e. since its skewedness is zero and its expansion coefficient is 3. In order to study the normality of error term, the study made use of Jarekbro test. The results showed that the assumed series is not normal, so SPSS software was utilized to estimate all the variables.

Table 6. Descriptive statistics

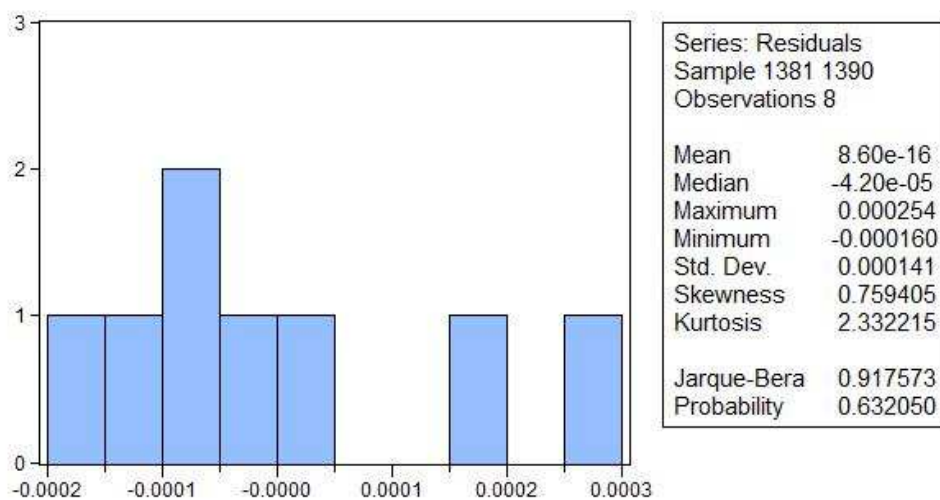
	N	Minimum	Maximum	Mean	Std. Deviation
Zscore(VAR000001)	295	-.79519	7.06274	.0000000	1.0000000
Zscore(VAR000002)	336	-.47475	5.40695	.0000000	1.0000000
Zscore(VAR000003)	338	-2.47316	4.69492	.0000000	1.0000000
Zscore(VAR000004)	340	-2.36867	2.78936	.0000000	1.0000000
Zscore(VAR000005)	340	-2.30736	1.85356	.0000000	1.0000000
Zscore(VAR000006)	338	-2.29724	9.44970	.0000000	1.0000000
Zscore(VAR000007)	293	-3.00760	2.35067	.0000000	1.0000000
Zscore(VAR000008)	340	-2.97903	2.42526	.0000000	1.0000000
Zscore(VAR000009)	216	-4.17314	2.98943	.0000000	1.0000000
Valid N (listwise)	161				

Fig 1.



Jarekbro test for the time series data of Iran shows the normality of error term and null hypothesis is not rejected.

Fig 2.



The estimation results of the contributive factor to the development of life insurance industry using GMM for 34 developed countries for the years 2002 to 2011 have been given in table 7.

Model 1: $Pen_{it} = \alpha + \beta_1 Pen_{it} + \beta_2 Rgdp_{it} + \beta_3 Popg_{it} + \beta_4 Dep_{it} + \beta_5 Urb_{it} + \beta_6 Inf_{it} + \beta_7 Ep_{it}$

Table 7. The result of model estimation using generalized acceleration method

Dependent variable	Pen	
Independent variable	coefficients	probability
Pen (-1)	0.2665116	**0.000
Rgdp	-0.00508403	0.416
Popg	0.010526	0.068
Dep	-0.01325933	0.000
Urb	0.1514481	0.021
Inf	0.0132898	0.000
Ep	0.0506709	0.001
CONSTANT		0.301

It is worth noting that Sargan test (1958) is utilized to determine any type of correlation among the instruments and errors. It is worth noting that it is necessary for validation of instruments that there is no correlation between instruments and error terms, the null hypothesis for this test is that instruments are valid to the extent that they are not correlated with first class differential equations. The hypothesis supporting can provide evidences on the appropriateness of instruments, In addition, null hypothesis of Sargan tests is not to be rejected and it is possible to say that the utilized instruments are appropriate in this model. Also, the results of self-correlated test show that self-correlation is solved in the above-mentioned model, according to table 7 and model 1, one would say that the insurance inclusion coefficient categorized by one pause Pen_{t-1} is positive and significant. This result shows the dynamic fashion of sample one throughout the time so that increase in life insurance inclusion coefficient is expanded by the next period. As it is seen, in developed countries, the rate of GDP does not have significant effect on the inclusion coefficient of insurance. As it was expected, the effect of population growth effect $Popg$ on the inclusion coefficient of insurance in model 1 for developing countries is positive and significant at 90% level of significance. This is done so that in studied model, 1% increase in population growth leads to 0.01% increase in the inclusion coefficient of life insurance, in developed countries, the growth of population increases the inclusion rate of insurance across community due to the fact that people are mostly supported by life insurances.

Dependency rate in model 1 has a strong and positive effect on inclusion coefficient of insurance at 99% level of significance so that in the studied model, 1% increase in dependency rate decreases 0.13% inclusion coefficient of insurance. The increase of dependency rate in developed countries leads to reduction in income on the part of the families.

Urbanization rate in model 1 has a strong and positive effect on inclusion coefficient of insurance at 95% level of significance so that in the studied model, 1% increase in urbanization rate increases 0.15% inclusion coefficient of insurance. The inflation rate in developing countries has a positive and significant effect on inclusion coefficient of insurance. The increase of urbanization rate in developed countries leads to increase in inclusion coefficient of insurance. One of the variables that lead to increase in productive premium of life insurance as nominal is the equilibrium coefficient which is affected directly by the inflation rate.

Life expectancy in developed countries has a positive and strong effect on the inclusion coefficient of insurance at 99% level. That is to say that the increase of life expectancy increases the demand motivation for life insurances as the secure investment. The results of estimation on the counterpart relationship between economics growth and unequal income fashion using OLS method for Iran for the years 1991 to 2010 have been shown in table 8 based on model 2.

$$\text{Model 2: } Pen_t = \alpha + \beta_1 Rgdpt + \beta_2 Popgt + \beta_3 Dep_t + \beta_4 Urb_t + \beta_5 Inf_t + \beta_6 Ep_t$$

Table 8. The results of estimation using OLS method

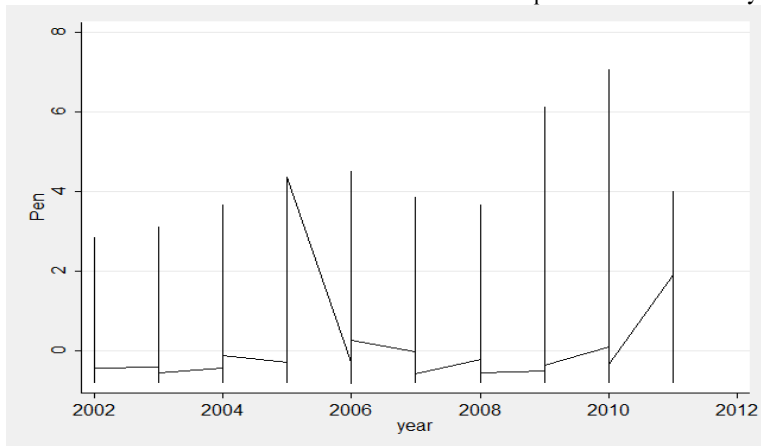
Dependent variable	Pen	
Independent variable	coefficients	probability
Rgdp	0.000000002	0.9135
Popg	-0.028093	0.0265
Dep	0.000584	0.0088
Urb	0.000355	0.2874
Inf	-0.000191	0.0326
Ep	0.0000037	0.4699
Heteroskedasticity Test: Breusch-Pagan-Godfrey	F-statistic: 0.522481	0.7586
Serial Correlation LM	F-statistic: 0.662906	0.5660
Durbin-Watson	3.340426	Weak self-correlation
R²	0.997	*****

It is worth mentioning that Heteroskedasticity is used to study the unequal variance which rejects the results of Breusch-Pagan-Godfrey 4 test of any type of unequal variance. Serial correlation and is used to study the correlation itself which rejects the test results of Breusch-Pagan-Godfrey. The value of Watson is approximately 4 which indicate weak self-correlation. The determining factor shows the extent to which the variable changes are due to the changes of independent variable and that all other dependent variables are related to other elements. In the above-mentioned models, the obtained R^2 is high and equal to 0.99.

Population growth effect in model 2 has a negative effect on inclusion coefficient of insurance at 95% level of significance so that in the studied model, 1% increase in population growth increases 0.02% inclusion coefficient of insurance. The population growth in developing countries increases despite the existed conditions such as inflation and international sanctions which lead to unemployment and lowering the amount of annual income. Since life insurance is regarded as a luxury goods, its demand is decreased by lowering the population growth.

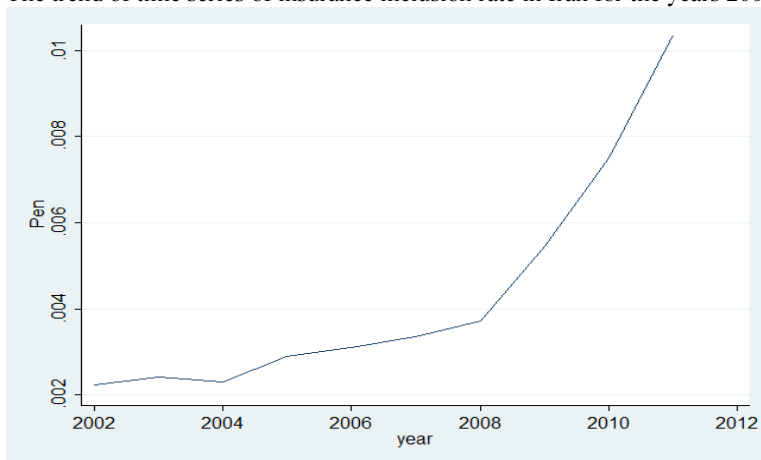
Dependency rate in model 2 has a strong and positive effect on inclusion coefficient of insurance at 99% level of significance so that in the studied model, 1% increase in dependency rate increases 0.0005% inclusion coefficient of insurance. The inflation rate in developing countries has a positive and significant effect on inclusion coefficient of insurance. Unlike the developed countries, the increase of urbanization rate in developing countries such as Iran leads has a negative and significant effect on the inclusion rate of insurance at 95% level so that in the studied model, 1% increase of it leads to 0.0001% decrease in the inclusion rate of insurance. In developing countries, the increase of inflation rate decreases the purchase power of people which results in lowering the amount of life insurance demanding. Other studied variables (gross domestic product, life expectancy and urbanization) do not have a significant effect on the inclusion rate of insurance.

Fig 3. The trend of time series of insurance inclusion rate in developed countries for the years 2002-2011



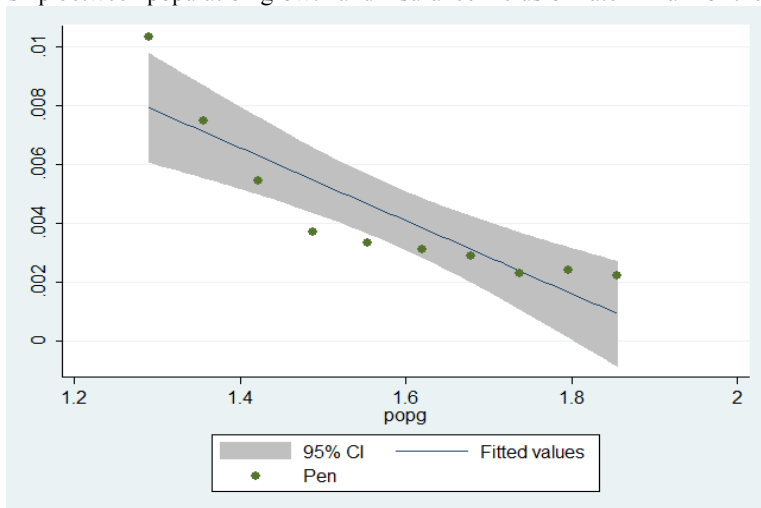
The results of fig 3 show that in developed countries, there has been smooth increase in the development of insurance industry

Fig 4. The trend of time series of insurance inclusion rate in Iran for the years 2002-2011



The results of fig 4 show that in Iran, there has been smooth increase in the development of insurance industry and is hare in gross domestic product has been increased

Fig 5. The relationship between population growth and insurance inclusion rate in Iran for the years 2002-2011



Conclusion

Based on the results obtained from hypotheses testing using generalized acceleration method for developed countries and Iran for the year 2002-2011, it is seen that the life insurance has not been regarded highly by Iranian people and in most of the developing countries. The statistics and comparisons with indexes such as the value of inclusion rate of insurance show that the demand of life insurance has followed a decreasing fashion despite the fact that it has stepped in its 80 years of establishment.

The characteristics of life insurance cause the fact that is possible to make use of this insurance in activating the investment market. Integrated savings of companies relevant to this insurance can activate profitable economic activities. Since the time interval is of great importance as viewed by the life insurance experts, considerable mathematic-based resources are formed in relation to each contract through making use of which the insurance company can activate the investment market and have a significant role in the investments. The study of the insurance trend and that of life insurance have been ever increasing during the past few decades. The present study which has been carried out on macroeconomic level, the results indicate that developing the afore-said insurance has a positive relationship with the inflation rate, life expectancy, rate of urbanization and population growth in developed countries. However, in Iran, the life insurance industry has a positive and significant relationship with depend rate and negative one with population growth rate of inflation.

Suggested policies for developing life insurance industry in Iran

Based on the obtained results and the market structure of insurance compared to developed countries, one would follow the mentioned suggestions in order to pave the way for forming culture and developing the life insurance. Since the economic, political, cultural and insurance-based framework of developed countries has fundamental differences with those of developing countries, it is not surprising that the result of the compared groups is significantly different. It is concluded from the result of life expectancy and urbanization rate in developed countries that if the government in developed countries draws specific attention to these sections, positive results will be unleashed.

Among the framework-based issues of life insurance is its public-rooted section policy, the government is suggested to devise a plan and exclude this industry from being franchise-based. It is recommended further that the central insurance accelerates the process of forming life insurance companies. In addition, the government can allow the entering of foreign companies to life insurance market for increasing competing and facilitating the technology involvement in the country. Also, it is believed that encouraging the activities of inter-country companies to be expanded in foreign countries.

Inflation is taken into account as the effective economic factors which reduced the adoptability of life insurance contractions. In order to overcome the issue, different solutions have been offered among which is to increase the premium and insurance investment simultaneously. One of the cultural and social concerns in the field of developing life insurance industry is modifying insurance culture and its development., this requires not only the endeavors of insurance companies and officials, but also it necessitates the cooperation of other section of society so that the probable deficiencies are solved in terms of culture, training and society and to increase the awareness of people pertinent to this valuable good. One would say that insurance companies are the most affective centers which play a great role in developing life insurances. So, they are suggested to modify their traditional methods and turn the attention of people toward themselves through making use of novel solutions in an attempt to attract new people to use the life insurances. To be tooted in government-based framework and that government is the focus of authority to control and monitor most of the organization in the country; it is possible to say that the government had the potential to evaluate the market condition of Iran life insurances ad their development in pre-revolution era. It is feasible that the government compares the global markets and developed countries so that the issues relevant to life insurances are unleashed and devises specific plans to develop the afore-said insurance through comprehensive and long-term as well as short-term polices.

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