

Empirical Study of the Determinants of Life Insurance Demand in Algeria**دراسة تطبيقية لمحددات الطلب على التأمين على الحياة في الجزائر****ZIANI Lila¹, ZIANI Zoulikha²**¹ University of Bejaia (Algeria), lila.ziani@univ-bejaia.dz² University of Bejaia (Algeria), zoulikha.ziani@univ-bejaia.dz**Received:** 05/07/2025**Accepted:** 12/12/2025**Published:** 31/12/2025**Abstract:**

This article seeks to determine the factors influencing life insurance demand in Algeria using the ARDL model for the period 1990-2022. Our empirical investigation reveals that GDP has a positive impact on life insurance demand in both the short and long term. Furthermore, we find that the "share of social security expenditure in health expenditure" and the level of financial development are significant but negatively correlated with life insurance demand. In contrast, the old-age dependency ratio and the university-level education rate do not show a significant effect on life insurance demand in either the short or long term.

Keywords: Life Insurance Demand, Insurance Density, Determinants, ARDL, Algeria.**JEL Classification Codes:** G22, C510, D12**الملخص:**

يهدف هذا المقال إلى تحديد العوامل المؤثرة على الطلب على التأمين على الحياة في الجزائر باستخدام نموذج ARDL للفترة 1990-2022. يكشف تحقيقنا التجريبي أن الناتج المحلي الإجمالي له تأثير إيجابي على الطلب على التأمين على الحياة في الأجلين القصير والطويل. علاوة على ذلك، وجدنا أن "حصة نفقات الضمان الاجتماعي من الإنفاق على الصحة" ومستوى التنمية المالية يرتبطان سلبًا بالطلب على التأمين على الحياة، وإن كانا مهمين إحصائيًا. في المقابل، لا يُظهر كل من نسبة الإعالة لكبار السن ومعدل التعليم الجامعي تأثيرًا ذا دلالة إحصائية على الطلب على التأمين على الحياة في الأجلين القصير أو الطويل.

الكلمات المفتاحية: الطلب على التأمين على الحياة، كثافة التأمين، المحددات، ARDL، الجزائر.

تصنيف JEL: G22, C510, D12

INTRODUCTION:

Person insurance, or life insurance as it's also called, are insurance policies that provide security against risks affecting individuals. Life insurance offers key benefits: firstly, it provides coverage and protection for policyholders against life's unexpected events; secondly, it can indicate and contribute to the growth of savings, both for individuals and the national economy; and finally, it serves as a way to attract savings over the medium and long term (Corfias, 2003, p. 182).

Worldwide, the life insurance market constitutes almost 60% of the premiums issued, illustrating the considerable importance of this sector. Indeed, life insurance has grown into a key pillar of the economy. In 2023, the global life insurance turnover reached 2889 billion US dollars, which is about 7% of the world's gross domestic product. However, the level of insurance development and its distribution vary significantly across the globe. Looking at the total premiums issued in 2023, over 75.5% were generated by developed countries, in contrast to just 24.5% by developing nations (Sigma, 2024).

While the life insurance sector in Africa is witnessing an increase in premiums, it still lags significantly behind other global regions in terms of development. In 2023, the total amount of life insurance premiums in Africa totaled 42.9 billion US dollars, accounting for 1.5% of the global life insurance market (Organisation des Assurances Africaines, 2024). Algeria's role within the continent is minimal, as South Africa and Morocco account for the largest portion of the premiums recorded for Africa.

As a matter of fact, insurance in Algeria is poorly developed and largely untapped. The insurance market as a whole, and the life insurance segment in particular, has not yet succeeded in generating figures that are truly beneficial for the Algerian economy. Despite ongoing efforts to encourage its growth, the life insurance sector shows a considerable delay; indeed, in 2023, the business volume of this branch only represented 11.44% of the total premium volume, and the penetration rate was a mere 3 USD per capita, far below the global average of 361 USD per capita (Sigma, 2024).

The unevenness in the demand for life insurance when comparing countries and regions raises the question of what drives these differences and, therefore, what factors affect this demand. Significantly, several empirical studies, utilizing various research methodologies, have investigated the determinants of the demand for life insurance (Headen & Finley lee, 1974), (Campbell, 1980), (Beenstock & al, 1986), (Outreville, 1990), (Brown & Kim, 1993), (Beck & Webb, 2003), (Lenten & Rulli, 2006), (Sen, 2008), (Kjosevski, 2011), (Park & Lemaire, 2012), etc.). Most of the empirical literature exploring the determinants of life insurance demand centers on developed countries. When it comes to developing countries, we have noted that the relevant studies are comparatively recent and less extensive than the research available for developed nations.

Starting from the observation of a research gap concerning the primary determinants of insurance demand, notably in Algeria, the purpose of this article is to identify the

determinants of life insurance demand in Algeria by implementing the ARDL model (Autoregressive Distributed Lag model), thereby contributing to a better understanding of the factors shaping life insurance. To achieve this aim, the article is structured in three sections. Section 1 offers a snapshot of the life insurance market in Algeria. Section 2 reviews the empirical literature on the determinants of life insurance demand. Section 3 details the empirical methodology adopted and presents the estimation outcomes derived from the ARDL cointegration method.

1- Life Insurance Demand Determinants: Literature Review

Through a review of the current theoretical and empirical literature, we have extracted a summary of the key determinants influencing life insurance demand. These determinants can be classified into three main categories: economic, demographic, and institutional.

1-1 Economic variables

The prevailing conclusion among prior studies examining the determinants of life insurance demand is that income stands as the primary economic factor positively influencing its uptake (see (Campbell, 1980), (Outreville, *The Economic Significance of Insurance Markets in Developing Countries*, 1990), (Brown & Kim, 1993), (Beck & Webb, 2003), (Outreville, *Life Insurance Markets in Developing Countries*, 1996), (Hwang & Gao, 2003), (Lenten & Rulli, 2006), (Sen, 2008), (Kjosevski, 2011), (Benahmed & Nemiri- Yaici, 2021)). This is because higher income levels enhance the affordability of life insurance and bolster individual savings capacity. Consistent with the majority of empirical analyses, GDP per capita will be employed as the measure of income level.

Inflation is identified as another key determinant of life insurance. Indeed, elevated inflation tends to dampen the demand for life insurance products by increasing their effective cost. Inflation acts as a drain on purchasing power, thus an increase in the inflation rate negatively impacts consumption levels, which in turn negatively affects savings levels and consequently, the demand for life insurance.

Empirical studies demonstrating the significant inverse relationship between life insurance demand and inflation include the works of (Beck & Webb, 2003), (Brown & Kim, 1993), Outreville (1996), (Hwang & Greenford, 2005).

Furthermore, several empirical studies (Outreville (1996), (Beck & Webb, 2003), (Sen, 2008) et (Kjosevski, 2011) conclude that there is a positive and significant relationship between financial development and life insurance demand.

Moreover, (Headen & Finley lee, 1974) view life insurance as a component within a household's financial asset portfolio, its holding being contingent in the short run on the price movements of other financial market assets. Outreville(1996) adopting a similar perspective, examines the relationship between financial development and life insurance growth across 48

developing economies, primarily highlighting the detrimental impact of financial market monopolies on the expansion of life insurance demand.

Considering that life insurance also functions as an investment, the importance of the stock market is undoubtedly a variable affecting life insurance demand. While rising stock prices positively influence the primary market, they likely negatively impact the demand for life insurance products, as stocks offer an alternative investment. However, similar to the real interest rate, empirical studies have not consistently identified the direction of this relationship. For (Headen & Finley lee, 1974), (Lim & Haberman, 2003)& (Chui & Kwok, 2009), this relationship is unclear.

To assess the extent of financial development in our study of Algeria, a developing country where the banking sector is prominent, we have chosen to use the broad money supply (M2) as a percentage of GDP.

Regarding the real interest rate, empirical literature reveals an ambiguous causal link with life insurance demand, and its consideration varies across studies. (Brown & Kim, 1993) do not account for the interest rate's effect on demand changes. Outreville (1996) finds no significant relationship between the interest rate and life insurance demand. In contrast (Beck & Webb, 2003) find a positive correlation between the real interest rate and life insurance penetration.

The unemployment rate, as an economic factor, is expected to negatively influence life insurance demand. Although few studies have specifically examined this impact, most suggest that a higher unemployment rate leads to lower demand for life insurance. Notable works include (Hammond, Houston, & Melander, 1967), (Beenstock & al, 1986)& (Lenten & Rulli, 2006). These authors argue that the unemployment rate is negatively correlated with household spending on life insurance, thus indicating a negative impact on life insurance demand.

1-2 Sociocultural variables

Empirical evidence from most studies [(Beck & Webb, 2003), Outreville (1990 & 1996), (Esho & al, 2004), (Park & Lemaire, 2012), (Benahmed & Nemiri- Yaici, 2021)] suggests a positive correlation between the level of education and the demand for insurance. Higher education levels improve an individual's understanding of the importance and benefits of saving through life insurance.

The variable of religion also plays a role in insurance demand. Indeed, several empirical studies [(Brown & Kim, 1993), Outreville (1996), (Chui & Kwok, 2009), (Ward & Zurbruegg, 2002), (Beck & Webb, 2003), and (Park & Lemaire, 2012)] have found that religion, particularly Islam, has a negative impact on life insurance demand. This can be explained by the negative perception of insurance in many contemporary Muslim societies, where it is likened to usury and gambling and seen as opposing divine will. Furthermore, the practice of insurance companies investing collected funds in interest-bearing assets before paying out

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claims likely reduces the demand for life insurance in countries with a strong Muslim religious identity.

Regarding the social security system, empirical literature largely indicates a negative correlation with life insurance demand [(Beck & Webb, 2003)et(Brown & Kim, 1993)]. A generous social security system tends to decrease the demand for life insurance by reducing individuals' perceived need for it, as it offers competing coverage against illness, mortality, disability, and other risks typically covered by life insurance products.

1-3 Demographic variables

Commonly considered demographic variables include the rate of urbanization, the population's age composition, and life expectancy.

The effect of the urbanization rate on the demand for life insurance has not been widely researched. However, the limited studies available suggest a positive link between the urbanization rate and the level of life insurance demand. Specifically, the findings ofHwang et Greenford (2005) &(Beck & Webb, 2003)indicate that countries with larger urban populations experience greater demand for life insurance, likely due to easier distribution of these products in urban areas.

The relationship between life expectancy and life insurance demand has been examined by several authors, including (Beenstock & al, 1986), Sen (2008) and Feyen et al. (2011), (Nesterova, 2008). Their research points to a positive correlation between longer life expectancy and higher life insurance demand. Conversely other studies (Browne & Kim (1993), Outreville (1996), and Beck & Webb (2003)), report an unclear relationship between these two variables.

The impact of the population's age structure, often referred to as the demographic dependency ratio, is also a determinant of life insurance demand. The demographic dependency ratio represents the ratio of individuals presumed to be "dependent" – the young and the elderly – to the working-age population. The most common measure of demographic dependency compares the number of individuals under 20 and over 65 to the population aged 20 to 64. Two other useful indicators are the youth dependency ratio (under 20) and the old-age dependency ratio (65 and over), both calculated relative to the 20-64 age group.

Empirical studies show that the demographic structure can have a mixed impact on life insurance demand, with the direction depending on the dominant population segment. The relationship between dependency ratios and insurance demand is, in fact, unclear.For Brown & Kim, 1993; (Curak & al, 2013), suggest a positive impact of the dependency ratio on life insurance demand. Beck & Webb (2003) found an ambiguous effect for the youth dependency ratio but a positive one for the old-age dependency ratio. The results from Browne & Kim (1993), (Truett & Truett, 1990) point to a positive correlation between the old-age dependency

ratio and insurance penetration. On the whole, life insurance demand is generally expected to be positively related to the dependency rate.

1-4 Institutional variables

The institutional quality (governance) of a nation shapes the economic, social, and structural landscape in which insurance companies conduct their business. Factors such as political and legal stability, government effectiveness, and the fight against corruption are crucial for the smooth operation of life insurance firms. Furthermore, strong governance significantly aids in lessening information asymmetries and enhancing the profitability of life insurance companies' investments, consequently making their offerings more attractive and accessible (Beck and Webb, 2003; Kjosevski, 2012). This perspective was later reinforced by the research of [La Porta et al. (1997) and (1998) and Levine (1998) and (1999)], who showed that the legal, regulatory, and political context has a substantial effect on the insurance industry

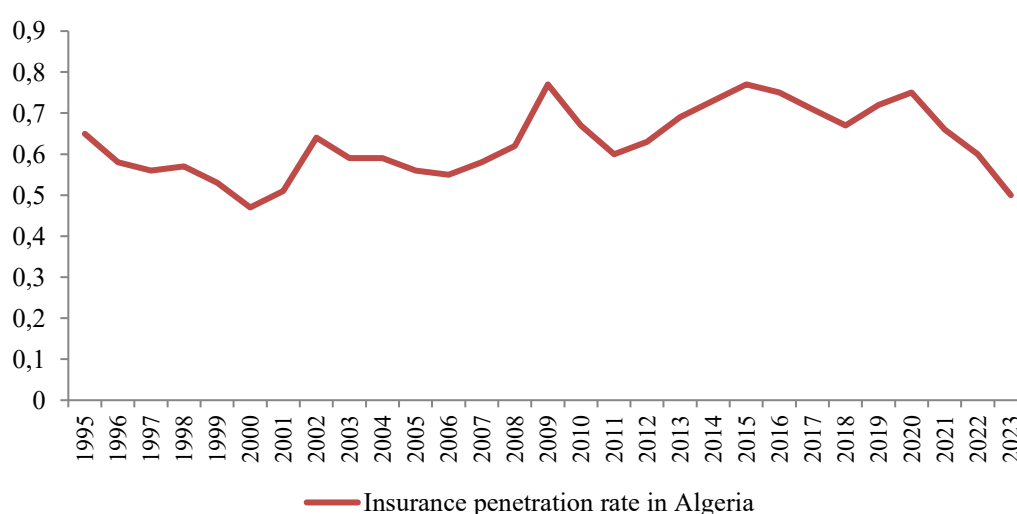
2- Life Insurance in Algeria: A situation Analysis

This section will be dedicated to understanding the role of life insurance within the Algerian insurance market. However, before delving into that, we find it necessary to present a general outline of the Algerian insurance market.

2-1 Main Characteristics of the Insurance Market in Algeria

Despite the Algerian insurance sector having experienced real growth over the last three decades, its significance within the economy, notably in the formation of GDP, remains considerably lower in comparison to other nations. Regarding the penetration of the insurance sector into GDP, Algeria exhibits a significant lag; the insurance industry contributes only marginally to GDP, registering a rate of approximately 0.5% in 2023. Algeria remains considerably below the global average of 7% and the African average of 2.4% in 2023.

Fig (1): Evolution of the Insurance Penetration Rate in Algeria (1995-2023)

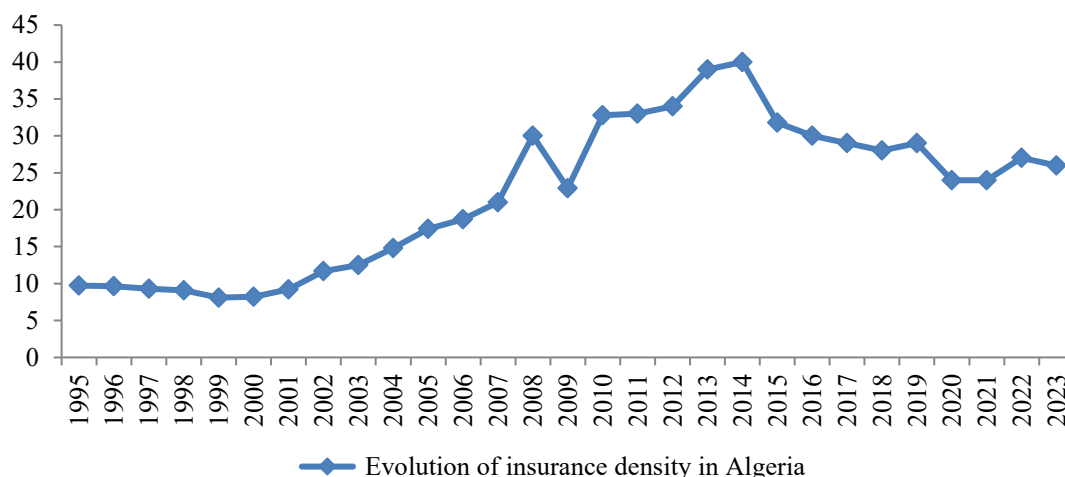


Source : Sigma Reports. Swiss-Re

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The same applies to insurance density. Indeed, the average annual insurance expenditure per person in Algeria is estimated at 3406 Algerian Dinars, or 27 current US dollars in 2022, which is negligible considering that the global average insurance density was 853 US dollars per person per year in 2022. In other words, in 2022, Algerians spent 31 times less on insurance than the global average, 5 times less than Moroccans, and 3 times less than Tunisians. With this density, Algeria was ranked 84th out of 88 countries in a 2022 study by the Swiss insurance review "Sigma revue". This low insurance density is mainly explained by: the restriction of individual spending to only mandatory insurance, neglecting other types of optional insurance; the social context of recent years has not favored a real enthusiasm for economic insurance; and finally, socio-cultural factors have also contributed to this passivity of individuals towards insurance. Indeed, the lack of communication, the absence of culture, the spirit of tribal and family mutual aid, the entrenchment of the social security system in people's minds, and the inertia of insurance companies in terms of innovation and adaptation of products to real needs are all elements that have not contributed to the growth of insurance.

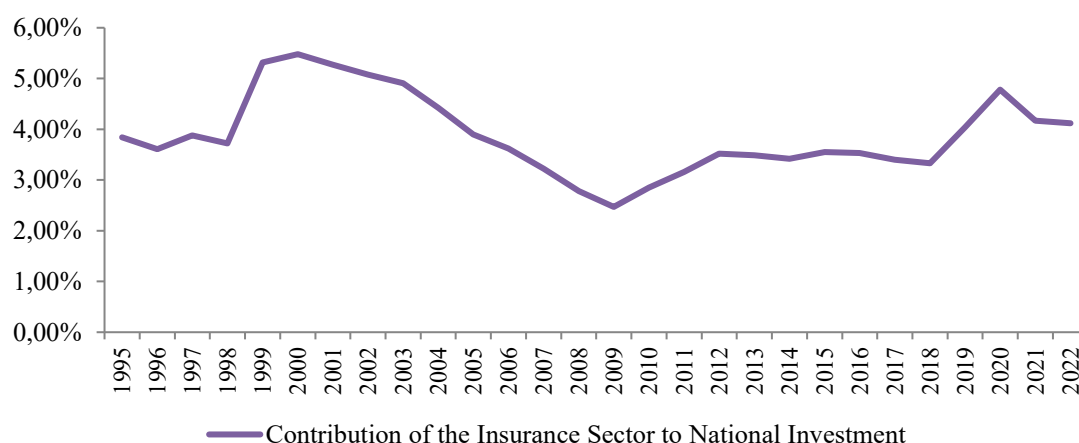
Fig (2): Evolution of Insurance Density in Algeria (1995-2023)



Source : Sigma Reports. Swiss-Re

Regarding the contribution of the Algerian insurance sector to national investment, the data in Figure 3 indicate that although the amounts allocated by insurance companies to financial investments are increasing year after year, their contribution to national investment remains very modest and stable throughout the period considered. Insurance companies' investments cover between 3 and 5% of national investment, which is negligible when one knows that in developed countries, particularly France, these investments can cover up to 50% of national investments. This is mainly explained by the fact that the interest rates practiced are very low.

Fig (3): Contribution of the Insurance Sector to National Investment from 1995 to 2022



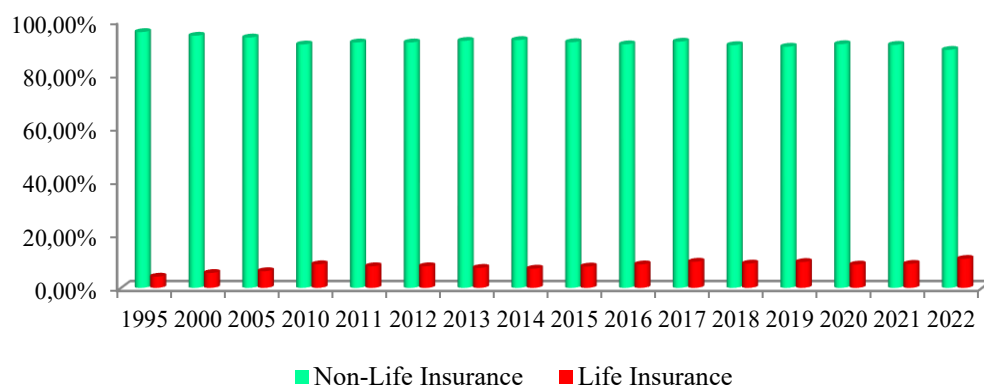
Source: Authors' creation based on National Insurance Council data

2-2 The Life Insurance Market in Algeria: A Situation Analysis

In Algeria, the bulk of the Algerian insurance sector's turnover comes from non-life insurance (as shown in Figure 4). The breakdown of turnover from 1995 to 2022 clearly shows that life insurance occupies a very marginal position, averaging just 8.11% of the total market during this period. This share is strikingly small when compared to the global life insurance market, which represents over 41.05% of total premiums, and even more so when looking at countries like Indonesia (62.27%), Malaysia (73.11%), and Pakistan (54.82%) where life insurance dominated the total market in 2022. (Sadi, 2016, p. 146) explains this by factors such as the optional nature of most life insurance policies, a lack of insurance awareness, religious considerations, the presence of a relatively strong social security system, the absence of a well-developed financial market, and the lack of necessary financial instruments for insurance activities. However, despite the small share of the Algerian life insurance market within the total, it has shown positive growth since the market opened up, thanks to the efforts of insurance companies in various areas, including the introduction of new life insurance products, a somewhat specialized distribution network, and attempts to create specialized life insurance companies. In addition, some insurance companies have launched Islamic insurance “Takaful”, in accordance with the principles of Islamic Sharia, notably Salama Insurance Company Algeria, which should constitute a promising means of meeting the insurance needs of the Algerian population while respecting the ethical precepts of Islam (Bennaoum & Hakmi, 2024).

Fig (4): Evolution of Non-Life and Life Insurance Production from 1995 to 2022, in %

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Source: Authors' creation based on National Insurance Council data

Regarding the structure of the non-life insurance portfolio, the market is overwhelmingly dominated by two key areas: automobile insurance and "Property Damage Insurance. These two branches together account for an average of 93% of the total market output. This strong dominance stems from the fact that these two aforementioned branches are mandatory. The remaining market share is divided among the other branches, which include agricultural insurance (2%), transport insurance (5%), and credit insurance (less than 1%).

Table (1): Market Production by Non-Life Insurance Branches (Unit: millions of DZD)

Branch	Year of 2022	
	Amount	Portion
Automobile/Car Insurance	65 243	47%
Property damage Insurance	64 367	46%
Transport	7 407	5%
Agricultural Risks	2 445	2%
CreditInsurance	46	0%
Total	139 507	100%

Source: (Ministry of Finance, 2022, p. 12)

Concerning the structure of personal insurance, it is pertinent to note that from 2011 to 2022, this sector is primarily characterized by life-death insurance, which fluctuated between 36% and 42%. Group personal accident insurance occupies the second position, with a share varying between 30% and 19%. Travel assistance ranks third, accounting for 12% of the market, an increase from its 7% share in 2021. This growth is largely attributable to the increased uptake of international travel assistance contracts following two years of Covid-related border closures. To a lesser extent, accident insurance represents 8%. Notably, the health insurance segment continues to hold a minimal share of 1% within the personal insurance market. This can be attributed to the established social security system, which provides coverage for up to 80% of medical and pharmaceutical expenses and 100% for recurring and/or costly treatments (chronic illnesses, major surgical procedures, hospitalizations exceeding 30 days). The capitalization branch, for its part, remains at a level not exceeding 0.1%, placing it in the final position. Table 1 illustrates the evolution of the personal insurance structure in Algeria over the period 2011-2022.

Table (2): Evolution of the Structure of Personal Insurance (2011-2022)

Branches	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Life and Death Insurance	36,7%	30,34 %	27,44 %	29,6%	32,02 %	33,23 %	38,6%	36,24 %	37,73 %	46,47%	47%	42%
Group Personal Protection	30,06 %	30,88 %	26,57 %	26,2%	27,04 %	29,07 %	26,3%	29,79 %	30,85 %	29,72%	29%	38%
Assistance	12,21 %	20,84 %	21,76 %	24,2%	28,14 %	25,26 %	22,0%	22,44 %	17,92 %	10,84%	7%	12%
Accident Insurance	17,75 %	13,83 %	16,33 %	18,8%	12,04 %	11,70 %	12,3%	10,74 %	12,75 %	6,84%	11%	8%
Health Insurance	3,24%	4,06%	7,9%	1,2%	0,76%	0,74%	0,7%	0,75%	0,71%	6,03%	5%	1%
Capitalization	0,04%	0,05%	0,00%	0,00%	0,00%	0,00%	0,00%	0,04%	0,04%	0,1%	0.00%	0.00 %

Source: Authors' creation based on National Insurance Council data

The personal insurance portfolio is typically structured into two categories of insurance: personal insurance designed for individuals and "collective group" personal insurance intended for a group of individuals belonging to an enterprise, an association, a public administration, sports clubs, and so forth. When considering the type of contract, individual contracts represent over half of the personal insurance sector, accounting for 59.70% in 2022. Collective contracts, on the other hand, constitute only 40.30% of personal insurance.

Fig (5): Breakdown of Life Insurance Production by Type of Contract (2022)



Source: (National Insurance Council, 2022, p. 5)

3- Estimation of the Determinants of Life Insurance Demand in Algeria

The purpose of this section is to identify the factors affecting life insurance demand in Algeria, utilizing the Autoregressive Distributed Lag (ARDL) model.

3-1 Methodology and variables selection

To quantify life insurance demand, we employed life insurance density, defined as the ratio of total life insurance premiums to the total population of a specific country. The explanatory variables considered are GDP per capita (GDPPC), the Tertiary Gross Enrollment Ratio (TGER), the Old-age Dependency Ratio (ODR), financial development (FD) calculated as M2 as a percentage of GDP, and the proportion of social security expenditure relative to total health expenditure. The data concerning life insurance density were sourced from the Sigma

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review published by the international reinsurance company (Swiss-Re). The remaining data utilized in this study originate from the World Bank database (2022). The variable representing social security expenditure as a percentage of total health expenditure was extracted from the World Health Organization (WHO) database. The selection of these variables was informed by the preceding literature review.

Table (3): Summary of hypothesized Relationship between the variables

Number	Variable	Hypothesized Relationship
1	GDP Per Capita (GDPPC)	Positive
2	Old Dependency Ratio(ODR)	Positive
3	Financial Development (FD)	Positive
4	Tertiary Gross Enrollment Rate (TGER)	Positive
5	Social Security Expenditure (SS)	Negative

Source: Own Processing

3-2 Study of Stationarity and Selection of the Optimal Number of Lags

To ensure the suitability of the selected variables for the ARDL analysis, their stationarity was examined using the Augmented Dickey-Fuller (ADF) test. It should be noted that the variables underwent a logarithmic transformation. The results of this stationarity test are presented in Table 4.

Table (4): Results of the ADF unit root test

	AtLevel		First Difference		Order of Integration
	T-Statistic	Prob	T-Statistic	Prob	
LLID	-2.391537	0.3767	-8.077048	0.0000	I(1)
LORD	-0.853411	0.9493	-5.080799	0.0000	I(1)
LFD	-2.728379	-2.728379	-4.860935	0.0025	I(1)
LGDPCC	-1.203656	0.8928	-3.571586	0.0008	I(1)
LTGER	-2.161765	0.4936	-4.293313	0.0098	I(1)
LSS	-1.712257	0.7198	-5.133332	0.0002	I(1)

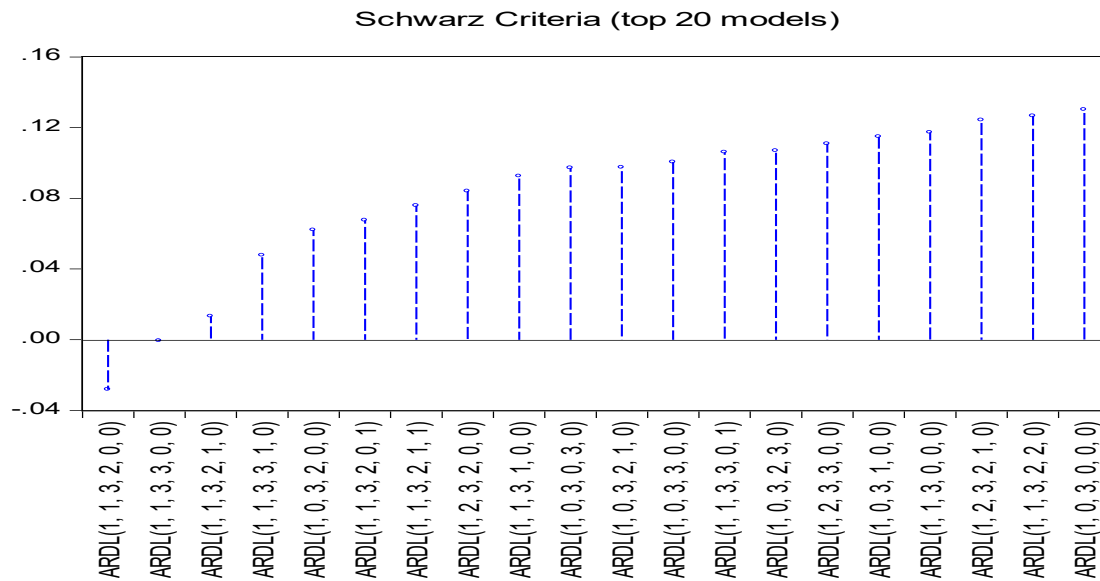
Source: Own Processing Based on Eviews 9 outputs

The results demonstrate that all series become stationary after taking the first difference. Crucially, it must be noted that none of the series included in our analysis are integrated of order 2, as this is a fundamental prerequisite for employing the ARDL approach.

3-3 Determination of the Optimal Number of Lags

The determination of the number of lags within the ARDL model is likewise a significant step to prevent any misspecification of the models' dimensionality. Based on the preceding graph (according to the Schwarz Information Criterion), the ARDL (1, 1, 3, 2, 0, 0) model represents the optimal specification due to its minimal SIC value.

Fig (6): The optimal ARDL model according to Schwarz Criteria (1, 1, 3, 2, 0, 0)



Source: Own Processing Based on Eviews 9 outputs

3-4 Estimation of the ARDL Model

The ARDL (1, 1, 3, 2, 0, 0) model estimation results reveal a high goodness of fit of 98%, indicating that 98% of the variance in life insurance demand is accounted for by the chosen variables. The calculated Fisher statistic (74.10) significantly exceeds the critical Fisher table value at the 5% level (2.90). Moreover, following Granger's rule ($R^2=0.98 < DW=2.24$), the overall model is statistically significant. The complete ARDL model estimation results are provided in Table 5.

Table (5): Estimation of the ARDL model

Variables	Coefficient	Std.Error	t-statistic	Prob
LLID(-1)	0.010163	0.161377	0.062977	0.9505
LORD	4.778900	2.595739	1.841055	0.0831
LORD(-1)	-5.128462	2.617195	-1.959526	0.0667
LGDPPC	1.671906	1.606367	1.040800	0.3125
LGDPPC(-1)	-0.325972	2.328608	-0.139986	0.8903
LGDPPC(-2)	-3.543978	2.132439	-1.661936	0.1149
LGDPPC(-3)	7.566782	1.866630	4.053713	0.0008
LSS	0.043074	0.690834	0.062351	0.9510
LSS(-1)	-0.917467	0.601381	-1.525601	0.1455
LSS(-2)	-0.903321	0.426598	-2.117500	0.0493
LTGER	0.474876	0.610460	0.777898	0.4473
LFD	-1.406934	0.372825	-3.773707	0.0015
C	-32.67441	16.73703	-1.952222	0.0476
R²= 0.98):(T.statistic= 74,10 ;Prob=0.0000;DW=2.24				

Source: Own Processing Based on Eviews 9 outputs

3-5 Estimation of Short-Run and Long-Run Relationships: ARDL Cointegration

Following the estimation of the model, we conducted the ARDL Bounds test to ascertain the presence of a long-term relationship. The results of the Bounds test procedure, detailed in Table 4, indicate that the calculated Fisher statistic ($F=6.510641$) is significantly higher than the upper bound of the critical value interval at various significance levels. This

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compels us to reject the null hypothesis H_0 and, therefore, to conclude that a cointegrating relationship exists among the variables under consideration.

Table (6): ARDL Bound test

Significance	I0 Bound	I1 Bound
10%	2.26	3.35
5%	2.62	3.79
2.5%	2.96	4.18
1%	3.41	4.68
F-Statistic = 6.510641		

Source: Own Processing Based on Eviews 9 outputs

The estimation results for the long-term and short-term relationships, as presented in Table 7, reveal a negative and significant relationship between financial development and life insurance demand in the long run at the 5% significance level. This finding contradicts the results of prior empirical studies, notably those by Outreville (1996) and Beck & Webb (2003), which report a positive and significant association between financial development and life insurance demand. Conversely, considering the hypothesis of substitutable assets for insurance, an increase in interest rates on these assets leads to their greater attractiveness, at the expense of the demand for life insurance. In other words, in pursuit of higher returns, a rational individual will arbitrate between purchasing a life insurance policy and investing in another financial institution, such as a bank. In the context of Algeria, such a result is not unexpected given the absence of a well-developed financial market and the lack of necessary financial instruments for insurance activity within the country.

With a high elasticity of 5.42 at the 5% significance level, our estimation results indicate a long-term relationship between GDP per capita (GDPPC) and life insurance density (LID). A 1% increase in GDP per capita (GDPPC) is associated with a 5.42% increase in life insurance density (LID). In the short run, the GDP per capita (GDPPC) variable maintains its strong influence with a positive coefficient of 1.671906, suggesting that a one-unit increase in GDPPC leads to a substantial increase in life insurance density, which aligns with the literature review.

Consistent with expectations, social security exerts a negative and significant influence on life insurance density in the long term. This finding reinforces the argument put forth by Browne and Kim (1993) and Beck and Webb (2003) that a generous social security system should negatively impact the demand for life insurance by reducing individuals' need for such coverage.

Furthermore, the results of our study clearly demonstrate that the old-age dependency ratio variable is not significant in either the short term or the long term. This outcome is surprising and inconsistent with previous studies by Brown & Kim (1993), Curak&Gaspic (2011), and Truett&Truett (1996), which report a positive correlation between the old-age dependency ratio and life insurance demand.

Similar to the "old-agedependency ratio" variable, the "level of education" variable is not significant in either the long term or the short term.

Table (7): Estimation Results of the Short-Run and Long-Run Relationship

CointegratingForm				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LORD)	4.778900	2.595739	1.841055	0.0831
D(LGDPPC)	1.671906	1.606367	1.040800	0.0325
D(LGDPPC(-1))	3.543978	2.132439	1.661936	0.1149
D(LGDPPC(-2))	-7.566782	1.866630	-4.053713	0.0008
D(LSS)	0.043074	0.690834	0.062351	0.9510
D(LSS(-1))	0.903321	0.426598	2.117500	0.0493
D(LTGER)	0.474876	0.610460	0.777898	0.4473
D(LFD)	-1.406934	0.372825	-3.773707	0.0015
CointEq(-1)	-0.989837	0.161377	-6.133707	0.0000
Cointeq = LLID - (-0.3532*LORD + 5.4239*LGDPPC -1.7960*LSS + 0.4798*LTGER - 1,4214LFD- 33, 0099				
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LORD	-0.353152	1.061507	-0.332689	0.7434
LGDPPC	5.423861	1.664326	3.258892	0.0046
LSS	-1.795966	1.043955	-1.720348	0.0350
LTGER	0.479751	0.615003	0.780080	0.4461
LFD	-1.421379	0.437987	-3.245256	0.0048
C	-33.009887	14.843357	-2.223883	0.0400

Source: Own Processing Based on Eviews 9 outputs

3-6 Validation Tests

The validity of our model was assessed using appropriate empirical tests, including the test for autocorrelation of errors, the test for heteroscedasticity, and the Jarque-Bera (JB) test for the normality of the residuals.

The findings presented in Table 8 lead us to conclude that there is no evidence of error autocorrelation, as the p-value (0.1091) is greater than the significance level of 0.05. Therefore, we fail to reject the null hypothesis of no serial correlation.

Table (8): Breusch-Godfrey Test for ErrorAutocorrelation

F-statistic	1.094709	Prob. F(4,13)	0.3997
Obs*R-squared	7.558910	Prob. Chi-Square(4)	0.1091

Source: Own Processing Based on Eviews 9 outputs

The outcomes of the Breusch-Pagan-Godfrey test for heteroscedasticity, as presented in Table 9, lead to the acceptance of the null hypothesis of homoscedasticity of the residuals at the 5% significance level, as the associated p-value exceeds 0.05.

Table (9): Breusch-Pagan-Godfrey Test for Heteroscedasticity

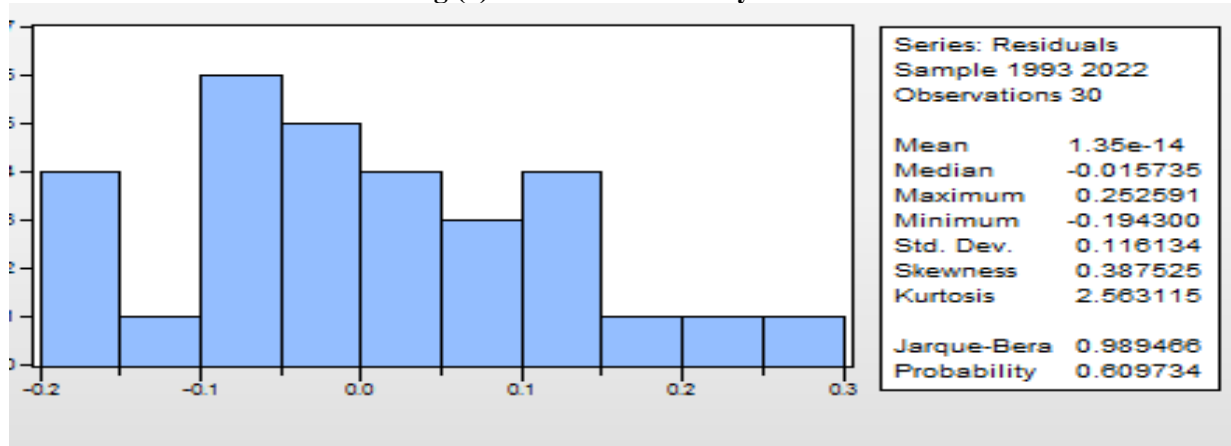
F-statistic	0.653657	Prob. F(12,17)	0.7705
Obs*R-squared	9.471806	Prob. Chi-Square(12)	0.6622
Scaledexplained SS	2.377108	Prob. Chi-Square(12)	0.9986

Source: Own Processing Based on Eviews 9 outputs

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Beyond the two preceding tests, a key step in confirming the validity of our model involves verifying the normality of the residuals. The data illustrated in Figure 7 reveal that the p-value associated with the Jarque-Bera statistic is greater than the 5% significance level, which enables us to validate the hypothesis of normal residual distribution.

Fig (7): Residual Normality Test



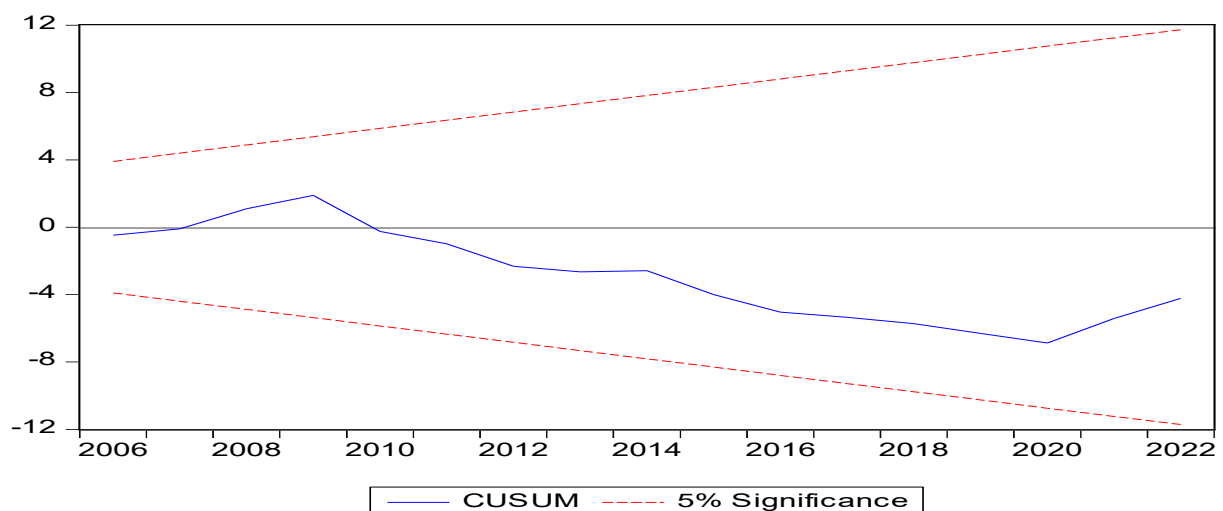
Source: Own Processing Based on Eviews 9 outputs

3-7 Model Stability Analysis

To assess the stability of our model, it is crucial to employ the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMSQ) stability tests.

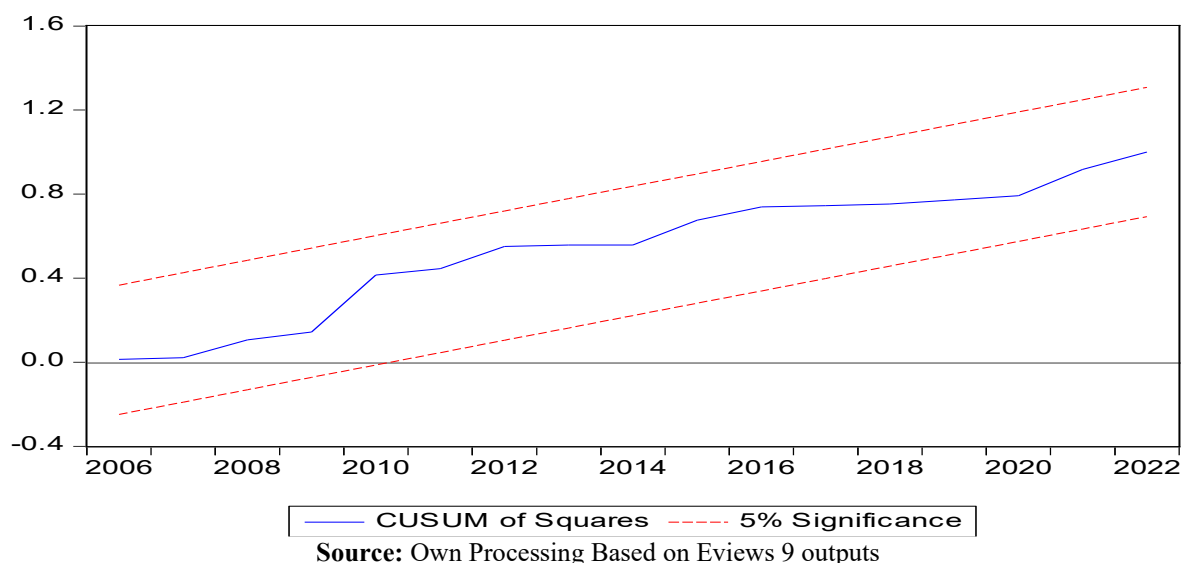
As demonstrated in Figures 8 and 9, the plotted CUSUM and CUSUMSQ statistics remain within the critical limits, thus indicating that all the coefficients of the model are stable over the course of the estimation period.

Fig (8): Cumulative Sum of Recursive Residuals (CUSUM)



Source: Own Processing Based on Eviews 9 outputs

Fig (9): Cumulative Sum of Squares of Recursive Residuals (CUSUMSQ)



Conclusion

The conclusions derived from the study on the determinants of life insurance in Algeria, employing the ARDL approach, indicate that the GDP per capita variable exerts a positive impact on life insurance demand in both the short run and the long run. Notably, the long-term elasticity is greater than the short-term elasticity, which is entirely consistent with the reviewed literature.

Likewise, the findings reveal that the social security variable is significant but negatively correlated with life insurance demand. This aligns with the econometric studies conducted, as the extensive reach of social security ensures coverage for almost the entire population, leading insured individuals to exhibit reluctance towards demanding life insurance products.

The results further indicate that the financial development variable is significant but negatively impacts life insurance demand in Algeria. This is primarily attributable to the absence of a well-developed financial market and the lack of necessary financial instruments for insurance activity within Algeria. Conversely, the other variables considered, namely the old-age dependency ratio and the university-level education rate, demonstrate no significant effect on life insurance demand.

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