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Analysis of solvency capacity of Algerian insurance companies in retaining underwriting risks

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***Abstract*---**This study aims to assess the financial solvency of Algerian insurance companies and their ability to retain the revenue generated from underwriting risks by examining retention and cession rates and analyzing the impact of financial solvency on their risk coverage capacity. Insurance companies in Algeria rely heavily on reinsurance as a key mechanism to manage risks, transferring a portion of risks that exceed their financial capacity. This practice often results in the cession of a significant portion of their revenue in certain cases. The study analyzes data from insurance companies operating in the market, including both general insurance and life insurance companies, during the period from 2018 to 2022. The research focuses on evaluating their financial solvency, comparing retention and cession rates, and benchmarking against industry standards derived from market data. The findings reveal that six companies struggle with low-risk retention capacity, four of which are due to weak financial solvency, while two face challenges from other factors. The study recommends strengthening the financial solvency of companies with low retention rates by increasing capital and reserves, improving reinsurance strategies, and adopting co-insurance mechanisms to reduce dependence on external reinsurance.

***Keywords*---**Solvency, Underwriting risks, asset liability management, Reinsurance, Retention Rate.

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Introduction

The underwriting operations carried out by insurance companies for various risks require them to allocate significant resources, both human and material. In many Algerian insurance companies, the expense ratio exceeds 30% of turnover, highlighting the difficulty of generating revenue in the sector.

Due to the nature of insurance companies' activities worldwide, they are often compelled to transfer part of the underwriting risk particularly the portion exceeding their financial capacity to cover in the event of a claim to reinsurance companies. In return, they receive a share of the commissions from these reinsurers, which helps cover the expenses associated with acquiring these contracts. However, in many cases, these commissions do not accurately reflect the actual expenditures incurred. Moreover, insurance companies relinquish a portion of their revenue to third parties. Therefore, it is essential for insurance companies to have strong financial solvency to retain a significant portion of their revenue. Based on the above, the central research problem of this study can be formulated as follows:
To what extent does the financial solvency of Algerian insurance companies enable them to retain underwriting risks?

This main issue gives rise to the following sub-questions:
- What are the differences in retention capacity between Algerian insurance companies in property insurance and life insurance?
- What is the financial solvency capacity of Algerian insurance companies in property insurance and life insurance?
- What is the relationship between the composition of underwriting risk portfolios and the retention rates of Algerian insurance companies?

Study Hypotheses:
- Life insurance companies suffer from low retention capacity, unlike property insurance companies.
- Algerian property insurance companies have strong financial solvency, unlike life insurance companies.
- Insurance for major industrial risks contributes to low retention rates in insurance companies.

Study Objectives:
- Analyze retention capacities in various Algerian insurance companies and assess the cession rates to reinsurance companies.
- Examine the development of life insurance companies, given their recent presence in the Algerian market—most were established after 2011.
- Identify the underwriting risks that cause deficits in retention capacity for insurance companies and propose solutions.

1. Solvency of Insurance Companies:

In insurance companies, significant attention is given to solvency standards, as they indicate these companies' ability to meet their future financial obligations toward insured customers. In addition to fulfilling future commitments, meeting financial solvency standards and capital requirements enables insurance companies to gain the trust of investors, policyholders, and regulatory government authorities (Ait Ouali & Mendil, 2024, p. 86).

The definitions of financial solvency vary, but they generally refer to the possession of sufficient resources by insurance companies to meet future customer claims. For example, the World Bank defines financial solvency as follows: *"Financial solvency refers to an insurance company's continuous ability to meet its obligations as they fall due; it is not merely about the company's continued existence"* (Thorburn, 2004, p. 02).

Table (01): Average Solvency Ratio for Net underwriting Premiums in Major Global Markets for 2023

Region	Average Solvency Ratio for Net Written Premiums
United States	100%
Canada	94%
United Kingdom	111%
Germany	90%
France	92%
Italy	100%
Japan	118%
Australia	68%
Average	99%

Source : (Swiss Re, 2023, p. 16)

2. Underwriting Risks:

Underwriting risks is the cornerstone of the entire insurance process. Proper selection of insured risks leads to a portfolio of low-risk insurance contracts, thereby reducing the volume of compensation claims. However, excessively strict criteria for selecting insurable risks can result in low revenue, pushing most customers toward competing companies. This directly impacts the company's technical results, as an insurance company needs to generate sufficient revenue to cover both operating expenses and compensation claims.

Some define underwriting risks as a fundamentally commercial process involving the assessment of insurance risks, the development of specific policy terms, and the determination of optimal premiums for the insured risks. Others view it as a knowledge-based risk management system whose quality and professionalism depend on the insurance company’s choices (Toshmurzaevich, 2020, p. 01).

The primary responsibility of risk assessment and monitoring lies with the risk management teams in insurance institutions. Therefore, insurance companies collect data on risk factors and assess risks to determine insurance premium costs and the underwriting policies adopted by the institution (Kamel & Naoual, 2024, p. 290). Underwriting processes can be divided into two main categories: non-life or property and casualty risk underwriting and life risk underwriting.

2.1 Property and Casualty Risk Underwriting:

Property and casualty insurance underwriting is characterized by short-term insurance contracts, typically lasting one year or less, making risk assessment generally more complex compared to life insurance.

McKinsey & Company, after conducting studies across various countries, affirms that there is no universal formula for successful underwriting policies, as they depend on factors such as region, type of insurance, customer base size, and product types. However, the firm recommends simplifying procedures and fully automating operations (Chester, Ebert, Kauderer, & McNeill, 2019, p. 03).

2.2 Life Risk Underwriting:

Life insurance policies vary in focus some emphasize the policyholder's health, others retirement, death risk, or other factors. Most life insurance types require an assessment of the individual's age at the time of application, referred to as the mortality risk. The process of collecting and analyzing data related to such risks is known as underwriting.

Actuaries calculate the cost of covering mortality risks over the policy's duration and translate this into premiums paid by the policyholder throughout the policy term. Additionally, all underwriting procedures are coordinated with reinsurance companies, as they assume a portion of the risks transferred by the insurer.

Insurance companies have also developed systems that assign points to customers based on their health status such as cholesterol and diabetes levels family medical history, driving records, and other factors. The final premium is determined based on the points accumulated (Maier, Carlotto, Sanchez, Balogun, & Merritt, 2019, p. 9374).

3. Retention Ratio:

The retention ratio refers to the portion of the insurance company's production that it retains, meaning it does not cede to national or foreign reinsurance companies. A higher retention ratio indicates a sound underwriting policy aligned with the company's financial capacity, particularly its solvency and risk-bearing ability. In other words, it reflects that the company's production efforts are not wasted by transferring them to other entities. Although reinsurance companies return some commissions to the insurer in exchange for its market activity, these commissions do not fully compensate for the lost opportunity associated with ceded risks.

However, this does not mean that a company must always strive for the highest possible retention ratio. Certain risks, particularly large industrial risks, are difficult for insurance companies to underwrite alone, as the potential compensation required in case of loss significantly exceeds their financial capacity. This is the primary role of reinsurance companies to absorb risks beyond an insurer's capacity. The retention ratio is calculated using the following formula:

$$\text{Retention Ratio} = \frac{\text{Retained Premiums}}{\text{underwriting Premiums}}$$

3.1 National Retention Ratio:

The national retention ratio represents the proportion of underwriting risks retained by national insurance companies, in addition to the risks retained by reinsurance companies from the risks ceded to them by national insurance companies. It is calculated using the following formula:

$$\begin{aligned} &\textit{National Retention Ratio} \\ &\quad = \textit{Retention Ratio of Insurance Companies} \\ &\quad + \textit{Retention Ratio of Reinsurance Companies} \end{aligned}$$

3.2 Cession Ratio:

The cession ratio refers to the portion of underwriting risks that an insurance company transfers to one or more reinsurance companies. It is calculated using the following formula:

$$\text{Cession Ratio} = \frac{\text{Ceded Premiums}}{\text{Underwriting Premiums}}$$

Alternatively, it can be expressed as:

$$\text{Cession Ratio} = 1 - \text{Retention Ratio}$$

4. Study on Retention Ratios in Algerian Insurance Companies During the Period (2018–2022):

Table (02): Data on Retention Volume in the Algerian Insurance Market (2018–2022)

Unit: Million DZD

Indicator	2018	2019	2020	2021	2022
National Production Volume	138,827	146,259	138,617	146,622	157,977
Retention Volume in Algerian Insurance Companies	95,578	98,193	94,771	93,859	98,088
Retention Rate in Algerian Insurance Companies	68.84%	67.14%	68.37%	64.01%	62.02%
Cession Rate in Algerian Insurance Companies	31.16%	32.86%	31.63%	35.99%	37.98%
Retention Volume in the National Reinsurance Company	19,871	22,304	19,780	22,241	23,588
Total National Retention Volume	115,449	120,497	114,551	116,100	121,676
National Retention Rate	83.16%	82.39%	82.64%	79.18%	77.02%

Source: *Prepared by the researcher based on the annual data of the National Insurance Fund*

The national production volume in the insurance sector increased between 2018 and 2022, rising from 138 billion DZD to 157 billion DZD, marking a 13.7% increase over five years. However, the total retained insured risks grew from 95 billion DZD in 2018 to 98 billion DZD in 2022, reflecting only a 3% growth. This indicates that Algerian insurance companies struggled to keep pace with the growth in their turnover, as the retention ratio declined from 68% to 62% over five years.

Considering the activity of the National Reinsurance Company (CCR), the overall national retention levels increased to 80%, meaning that one-fifth of the insurance sector’s turnover is ceded to international reinsurance companies. A more detailed analysis shows that CCR’s retention capacity grew from 19 billion DZD to 23 billion DZD, an 18.7% increase. However, despite the significance of this increase, it was not sufficient to offset the decline in retention levels among insurance companies. As a result, the national retention ratio fell from 83% to 77% overall.

Table (03): Distribution of the National Insurance Market Between General Insurance and Personal Insurance (2018–2022)

Indicator	2018	2019	2020	2021	2022
General Insurance Market Size	126,198	132,141	126,207	133,184	141,408
Personal Insurance Market Size	12,629	14,118	12,410	13,438	16,568
National Insurance Market Size	138,827	146,259	138,617	146,622	157,976
General Insurance Market Share	90.90%	90.35%	91.05%	90.83%	89.51%
Accepted Reinsurance Transactions from Abroad	4,377	5,888	6,059	6,657	6,807

Source: Prepared by the researcher based on the annual data of the National Insurance Fund

The turnover of the Algerian insurance market increased from 138 billion DZD in 2018 to 158 billion DZD in 2022, reflecting a 13.8% growth over four years, with an average annual growth rate of 3.46%. This growth rate is relatively low, given the weak insurance penetration in the Algerian economy, which remains below 1%. Considering the ongoing efforts to enhance the sector’s contribution to the national economy, significantly higher growth rates are necessary to match the penetration levels of neighboring countries.

The life insurance market, however, remains a minor segment of the industry, accounting for only 9% in 2018, with a slight increase to 10.5% in 2022. This marginal contribution has not significantly improved compared to pre-2011 levels, despite the separation of life insurance companies from general insurance firms to promote sectoral growth. In contrast, life insurance in developed Western economies represents over 50% of the total insurance market. Therefore, life insurance companies must intensify efforts to expand their market share.

Regarding inward reinsurance operations, premiums accepted from foreign insurers increased from 4 billion DZD in 2018 to nearly 7 billion DZD in 2022, marking a 55% growth. However, despite this significant increase, inward reinsurance remains marginal, accounting for only 4.3% of the total insurance sector in 2022. This is primarily due to Algeria not being a recognized reinsurance hub, as regional, continental, and international insurance companies do not frequently seek to reinsure their risks in the Algerian market.

5. The Cession Rate of Algerian Insurance Companies for Their Portfolios

To assess the extent to which insurance companies retain their underwriting premiums or insurance portfolios, we examine their published financial statements. The retention rate refers to the risks underwriting and retained by the insurance company, providing insight into the financial capabilities of Algerian insurance companies in relation to their activities.

5.1 Cession Rate of underwriting Risks in Property Insurance Companies

Table (04): Cession Rate in Algerian Property Insurance Companies (2018–2022)

Company	2018	2019	2020	2021	2022
CASH	-	88.50%	88.50%	89.20%	88.30%
CAGEX	-	69%	73.20%	67.50%	67.70%
CAAT	-	49.80%	51.70%	57.30%	61.40%
GIG	-	25.80%	28.80%	29.40%	43.30%
CAAR	-	41.90%	43.60%	35.30%	34.70%
AXA Dom	-	29.90%	31.40%	30.70%	25.10%
SAA	-	16.20%	19%	21.50%	23.20%
ALLIANCE	-	19.30%	21.30%	21.90%	22.80%
TRUST	-	29.30%	19.50%	19.80%	21.70%
SALAMA	-	22.10%	24.60%	22.50%	21.40%
GAM	-	9.60%	10.00%	9.70%	14.30%
CIAR	-	15.40%	18.10%	14.90%	13.60%
CNMA	-	5.80%	5.80%	7.10%	9.00%
SGCI	-	0.00%	0.00%	-	0.00%
Industry Average	31.16%	32.86%	31.63%	35.99%	37.98%

Source: Prepared by the researcher based on the annual data of the National Insurance Fund

Based on the data in the table above, which illustrates the cession rate of Algerian public insurance companies for underwriting risks, we find that CASH Insurance, a subsidiary of the Sonatrach Group specializing in hydrocarbons insurance, has the highest cession rate. The company retains only one-tenth of its portfolio, meaning it cedes nearly nine-tenths of its insurance portfolio—a significantly high rate that exceeds the acceptable levels for insurance companies.

In second place is CAGEX (Algerian Insurance and Export Guarantee Company), with cession rates ranging between 67% and 73%. Following in third place is CAAT (Algerian Insurance Company), whose cession rate increased from 49% in

2019 to 61% in 2022. As for CAAR (Algerian Insurance and Reinsurance Company), it recorded high cession rates in 2019 and 2020, but these rates dropped below the industry average in 2021 and 2022.

For the remaining companies operating in the property insurance market, their cession rates are generally lower than the industry average (the average cession rate for Algerian insurance companies), except for GIG and AXA, which experienced anomalies in one of the study years. Notably, GIG, SAA, Alliance, GAM, and CNMA have shown an increase in their retention rates over the years between 2018 and 2022, while the rest of the Algerian insurance companies have experienced a gradual and nearly continuous decline in their retention rates.

5.2 Cession Rate of Underwriting Risks in Personal Insurance Companies

Table 05: Cession Rate in Algerian Personal Insurance Companies (2018–2022)

Company	2018	2019	2020	2021	2022
L'Algérienne Vie	-	37.60%	46.80%	53.10%	53.50%
CAARAMA	-	48%	30.90%	52.20%	45.80%
TALA	-	28.40%	21.10%	21.90%	27.60%
AXA Vie	-	27.50%	27.70%	32.70%	25.10%
MACIR Vie	-	21.80%	18.50%	15.10%	18.70%
CARDIF	-	8.10%	9.90%	10.90%	12.70%
AMANA	-	11.90%	6.20%	6.40%	10.60%
Industry Average	31.16%	32.86%	31.63%	35.99%	37.98%

Source: Prepared by the researcher based on the annual data of the National Insurance Fund

Table 06: Ranking of the Top 10 Algerian Insurance Companies by Revenue in 2022

Unit: Million DZD

Rank	Company	Revenue	Market Share	Retention Rate	Capital
1	SAA	29,517	20.70%	76.80%	30,000
2	CAAT	26,727	18.80%	38.60%	20,000
3	CASH	18,892	13.30%	11.70%	10,000
4	CAAR	16,958	11.90%	65.30%	17,000
5	CNMA	13,285	9.30%	91%	5,500
6	CIAR	8,877	6.20%	86.40%	4,967
7	Trust	6,620	4.70%	78.30%	3,200
8	Alliance	5,449	3.80%	77.20%	3,529
9	Salama	4,284	3.00%	78.60%	2,000
10	GIG	3,922	2.80%	56.70%	-

Source: Prepared by the researcher based on the annual data of the National Insurance Fund

Based on the data in the table above, we observe that three Algerian insurance companies among the top ten in terms of revenue recorded a retention rate lower than the national average for 2022, which was 62.02%. These companies are CASH, CAAT, and GIG.

The weakest company in terms of retention is CASH Insurance, which retained only 11% of its underwriting risks. It is followed by CAAT (Algerian Insurance Company), which retained 38%, and GIG (Gulf Insurance Group), with a retention rate of 56%. This necessitates an analysis of the factors contributing to these low retention levels, particularly for companies with significantly low rates.

The significance of these findings increases when considering that two of the companies with retention rates below the industry average are the second and third-largest insurance firms in the Algerian market. Therefore, a detailed analysis of their portfolios and financial data is essential to understand the underlying causes of this imbalance.

6. Study of the Solvency Margin of Algerian Insurance Companies

The Algerian legislator mandates that both general insurance companies and life insurance companies comply with minimum solvency standards. The solvency ratio for technical provisions must exceed 15%, while the solvency ratio for underwriting premiums must be above 20%.

Table 07: Solvency Margin of Public Property Insurance Companies in 2022

Unit : Million DZD

Company	FSM	SITP	MMLR	SIUP	MMLR
SAA	43,911	139%	9	147%	7
CAAT	34,418	106%	7	129%	6
CASH	15,096	49%	3	80%	4
CAAR	22,120	122%	8	130%	7
CNMA	9,667	92%	6	74%	4
CIAR	6,678	63%	4	75%	4
Trust	3,938	105%	7	59%	3
Alliance	5,129	149%	10	94%	5
Salama	4,105	74%	5	96%	5
GIG	1,602	40%	3	41%	2

FSM = Financial Solvency Margin; SITP= Solvency Indicator for Technical Provisions; MMLR = Multiple of the Minimum Legal Requirement; SIUP = Solvency Indicator for Underwriting Premiums; MMLR = Multiple of the Minimum Legal Requirement.

Source: (Ministry of Finance, 2024, p. 40)

According to the table above, all Algerian public insurance companies comply with the legal solvency ratio, with their indicators exceeding the minimum required thresholds by a significant margin. Upon closer analysis, GIG and CASH Insurance recorded the lowest solvency ratios among their competitors, followed by CIAR.

Table 08: Solvency Margin of Personal Insurance Companies in 2022

Unit : Million DZD

Company	FSM	SITP	MMLR	SIUP	MMLR
L'Algérienne Vie AGLIC	1,213	20%	1	42%	2
CAARAMA	1,712	29%	2	78%	4
TALA	1,970	54%	4	128%	6
AXA Vie	1,278	88%	6	57%	3
MACIR Vie	1,578	273%	18	121%	6
CARDIF	2,044	76%	5	57%	3
AMANA (SAPS)	1,939	65%	4	91%	5

FSM = Financial Solvency Margin; SITP= Solvency Indicator for Technical Provisions; MMLR = Multiple of the Minimum Legal Requirement; SIUP = Solvency Indicator for Underwriting Premiums; MMLR = Multiple of the Minimum Legal Requirement.

Source: (Ministry of Finance, 2024, p. 40)

Similarly, the table shows that all Algerian personal insurance companies have achieved solvency ratios higher than the required legal thresholds (*15% for technical provisions and 20% for underwriting premiums*). However, AGLIC (Algerian Life Insurance Company) recorded the weakest solvency ratio among industry players, exceeding the legal requirement by only a small margin. It was followed by Karama Insurance, which doubled the required solvency threshold. In contrast, Karama and Amana Life Insurance Companies achieved four times the required solvency ratio.

7. Solvency of Companies with the Highest Ceded Premiums

Based on the previous analysis of retention, cession, and solvency indicators of Algerian insurance companies compared to the industry benchmark set for this study we identify the companies that exceed the industry standard in both general and personal insurance sectors.

Table 09: Solvency Indicators of Companies with the Highest Ceded Premiums

Company	Cession Rate	Financial Solvency	SITP	SIUP
CASH	88.30%	15,096	49%	80%
CAAT	61.40%	34,418	106%	129%
GIG	43.30%	1,602	40%	41%
CAAR	34.70%	22,120	122%	130%
L'Algérienne Vie	53.50%	1,213	20%	42%
CAARAMA	45.80%	1,712	29%	78%

SITP = Solvency Indicator for Technical Provisions; SIUP = Solvency Indicator for Underwriting Premiums

Source: *Prepared by the researcher based on the data presented in the study*

From the table, it is evident that the listed companies have the highest cession rates to reinsurance companies. This is a risk management strategy aimed at mitigating non-payment and financial insolvency risks.

- CASH Insurance (Caisse d'Assurances des Hydrocarbures) is the leading company in ceding its premiums, mainly due to the large-scale engineering risks it insures. Given that the company provides coverage for all hydrocarbon and refining facilities in Algeria, the size of these infrastructures surpasses the risk-bearing capacity of any domestic insurance firm.
- CAAT (Compagnie Algérienne d'Assurance et de Réassurance) ranks second in premium cession, largely due to its focus on industrial risks such as cement factories, refineries, and other major industries—risks that significantly exceed the company's financial capacity. However, it also provides automobile insurance, which does not heavily rely on reinsurance.

From the cession and solvency indicators, we observe the following:
- CASH (1st place) and GIG (2nd place) have very limited capacity to increase retention rates, as their solvency indicators leave little room for maneuvering.
- CAAT and CAAR, on the other hand, have solvency margins 7 to 8 times higher than the required legal threshold, which allows them to increase retention rates and reduce reliance on national and foreign reinsurance companies.

In the personal insurance sector, AGLIC (Algerian Life Insurance) and Karama Insurance exhibit low retention rates compared to other personal insurance companies in Algeria. This is mainly due to their weak solvency indicators, which barely exceed the minimum legal requirement. As a result, they cannot significantly increase their premium retention, as doing so would disrupt their financial balance. The following table summarizes the Algerian insurance companies that suffer from weak retention rates due to low solvency margins.

Table 10: Companies with High Cession Levels Due to Weak Solvency (2022)

<table>
<tr><td rowspan="4">Companies with High Cession Levels Due to Weak Financial Solvency</td><td>1- CASH</td></tr>
<tr><td>2- GIG</td></tr>
<tr><td>3- L'Algérienne Vie</td></tr>
<tr><td>4- CAARAMA</td></tr>
<tr><td rowspan="2">Companies with High Cession Levels Due to Other Reasons</td><td>1- CAAT</td></tr>
<tr><td>2- CAAR</td></tr>
</table>

Source: *Prepared by the researcher based on the previous analysis.*

Conclusion

Through this study and after analyzing the retention, cession, and solvency margin indicators of all Algerian insurance companies, especially the major ones, we can accurately address the study's hypotheses and research question.
- First Hypothesis Incorrect: The retention data of Algerian insurance companies reveal that general insurance companies cede more risks than

life insurance companies, despite the latter being relatively new in the market.

- Second Hypothesis Correct: The solvency margin data indicate that general insurance companies have significantly higher solvency levels, sometimes exceeding ten times those of life insurance companies.
- Third Hypothesis Correct: The analysis of retention and solvency indicators confirms that the companies experiencing severe financial constraints are those engaged in insuring large industrial risks, particularly CASH and CAAT.

Based on the data analysis, we can conclude that the financial solvency of most Algerian insurance companies allows them to retain a significant portion of the underwriting risks, except for CASH, GIG, Algerian Life, and Karama Insurance, which face solvency challenges.

Findings:

- The analysis of retention rates in Algerian insurance companies revealed a significant weakness in CASH's retention capacity. The study of its solvency margin indicates that this weakness is primarily due to its low financial solvency, in addition to its specialization in insuring large-scale industrial risks that far exceed its financial capacity.
- The retention rate analysis showed moderate weakness in GIG and CAAR during certain years within the study period, while acceptable retention rates were recorded in the remaining years.
- The retention rate analysis revealed a high level of cession in CAAT across all years of the study, despite the company maintaining an excellent solvency margin.
- The analysis of life insurance companies indicated a high cession rate in Algerian Life and Karama Insurance, accompanied by weak solvency margins in both companies.

Recommendations

- CASH should enhance its financial solvency by significantly increasing its capital to reduce its cession rates.
- GIG, Algerian Life, and Karama Insurance should increase their capital and reserves in proportion to their business volume.
- CAAR and CAAT can easily reduce their cession rates by revising their reinsurance strategies, which currently result in a significant loss of revenue despite their strong financial capabilities.
- It is advisable for the concerned companies to adopt co-insurance techniques to mitigate risks that necessitate heavy reliance on reinsurance.

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