The Impact of Financial Risk Management on Financial Performance in Algerian Insurance Companies A Case Study of the National Insurance Company (SAA) During the Period 2016-2022

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Abstract :

This study investigates the relationship between financial risk management indicators and financial performance at the Société Nationale d'Assurance (SAA) over the period 2016–2022. Focusing on liquidity, underwriting, and capital risks as determinants of return on assets and return on equity, the study employs Pearson correlation analysis on annual financial statement data. The findings confirm statistically significant relationships between all three risk categories and financial performance, with liquidity and underwriting risks exerting adverse effects, while capital adequacy demonstrates a positive influence. The results underscore the strategic importance of balanced risk management in sustaining insurer profitability and solvency within the Algerian insurance market.

Keywords: financial risk management, insurance companies, liquidity risk, underwriting risk, capital risk, financial performance.

JEL classification codes: G20, G22, G32, M41.

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Introduction :

The insurance industry stands as one of the fundamental pillars of the financial system across economies worldwide, fulfilling a vital role in mobilizing savings and channeling them toward productive investment, while simultaneously providing individuals and institutions with protection against a broad spectrum of potential risks.

What distinguishes insurance companies from other financial intermediaries is the inherently unique nature of their operations: their business model is built around the assumption and efficient management of risk, which is what ultimately enables them to honor future obligations and sustain long-term continuity. It is within this context that financial risk management occupies a position of considerable strategic importance in insurance operations, given its direct bearing on financial stability and overall institutional performance.

In recent years, against a backdrop of accelerating economic and financial change, insurance companies have found themselves navigating an increasingly complex set of pressures. These include macroeconomic volatility, unforeseen crises such as the COVID-19 pandemic, and climate-related disruptions that have driven a marked escalation in claims payouts. Collectively, these forces have compelled insurers to reassess and refine their financial risk management frameworks, with the overarching objective of preserving financial stability and sustaining consistent performance outcomes.

To this end, insurance companies rely on a set of financial risk indicators as the analytical foundation of their risk management practices. Liquidity indicators reflect the firm's capacity to meet short-term obligations; leverage indicators shed light on the financing structure and the extent of debt dependency; reinsurance indicators capture the degree to which risks are transferred to reinsurance counterparties; and underwriting and technical risk indicators — including the loss ratio, expense ratio, and underwriting surplus — provide a window into the operational efficiency of the insurance function itself. Together, these metrics serve as diagnostic instruments for evaluating solvency, assessing the stability of the financial structure, and gauging underwriting performance.

Despite the growing scholarly attention devoted to financial risk management, empirical studies examining insurance companies in the Algerian context remain notably sparse — particularly those investigating the relationship between financial risk indicators and financial performance. It is against this backdrop that the present study derives its significance. Specifically, this research examines the relationship between financial risk management indicators and

financial performance at the Société Nationale d'Assurance (SAA) over the period from 2016 to 2022, with the aim of illuminating the nature of this relationship and assessing the extent to which prevailing risk management policies contribute to the company's long-term sustainability.

Research Problem

Building on the foregoing discussion, the central research problem may be articulated through the following main question :

What is the nature of the relationship between financial risk management indicators and financial performance in insurance companies, and how do these indicators influence the financial performance of the Société Nationale d'Assurance (SAA) over the period 2016–2022?

This overarching question gives rise to the following sub-questions:

Q1. What is the effect of underwriting risk management on the financial performance of SAA over the period 2016–2022?

Q2. What is the effect of liquidity risk management on the financial performance of SAA over the period 2016–2022?

Q3. What is the effect of capital and solvency risk management on the financial performance of SAA over the period 2016–2022?

Research Hypotheses

To address the research problem outlined above, the following main hypothesis is proposed:

Main Hypothesis

There is a statistically significant relationship between financial risk management and the financial performance of SAA over the period 2016–2022.

This hypothesis is decomposed into the following sub-hypotheses:

H1. There is a statistically significant relationship between liquidity risk and the financial performance of SAA.

H2. There is a statistically significant relationship between underwriting risk and the financial performance of SAA.

H3. There is a statistically significant relationship between capital risk and the financial performance of SAA.

Research Objectives

This study aims to analyze the relationship between financial risk management indicators and the financial performance of SAA, while tracing the evolution of liquidity, leverage, reinsurance, and underwriting metrics across the study period. It further seeks to empirically test the effect of these indicators on the company's financial stability and overall performance.

Significance of the Study

The present study derives its significance from several complementary dimensions. It advances our understanding of how financial risk management shapes financial performance within insurance firms, and offers practical, evidence-based recommendations to management for strengthening institutional stability and improving financial outcomes. Moreover, the study generates a set of benchmarkable indicators that can be used for comparative analysis across peer insurance companies.

Scope and Delimitations of the Study

- **Spatial Scope**: The study is confined to the Société Nationale d'Assurance (SAA), Algeria.
- **Temporal Scope**: The analysis covers the period from 2016 to 2022.
- **Thematic Scope**: The study focuses specifically on financial risk management indicators pertaining to liquidity, leverage, reinsurance, underwriting, and technical risks. Market risk and foreign exchange rate risk fall outside the scope of this investigation.

Research Methodology

The study adopts a descriptive-analytical approach to examine the nature of the relationship between financial risk management indicators and financial performance. In addition, a quantitative methodology is employed to analyze the company's financial data over the period 2016–2022.

Research Instruments

The study draws on the following analytical instruments :

- The financial statements and annual reports of the Société Nationale d'Assurance (SAA).
- Financial analysis utilizing key performance indicators — specifically return on assets (ROA) and return on equity (ROE) — alongside a suite of financial risk management indicators.

- IBM SPSS Statistics software for data analysis, encompassing descriptive statistics (mean and standard deviation) and Pearson correlation analysis.

Structure of the Study

The study is organized around four principal sections :

1. Literature Review
2. Theoretical Framework of Financial Risk Management
3. Financial Performance Evaluation
4. Empirical Analysis

I- Literature Review

A substantial body of research has examined the relationship between risk management and financial performance, spanning diverse economic contexts and sectors comparable to the insurance industry. The most relevant studies are reviewed below.

Al-Tarawna (2015) investigated the effects of two sets of independent variables — external environmental factors (the legal, economic, and competitive environments) and internal firm-level factors (financial risk, internal control, and managerial efficiency) — on the financial performance of Jordanian insurance companies, as measured by return on assets (ROA) and return on equity (ROE). The study found that internal factors exerted a statistically significant effect on the financial performance of insurance companies listed on the Amman Stock Exchange. Notably, the economic and competitive environments exhibited an inverse relationship with both ROA and ROE, whereas internal factors had a positive effect on both performance measures, with internal control emerging as the most influential determinant.

Zaher (2020) examined the role of underwriting, liquidity, and capital risk management in improving the financial performance of private insurance companies listed on the Damascus Securities Exchange. The sample comprised five privately held commercial insurers over the period 2008–2018, with data drawn from their published financial statements. Financial performance was proxied by ROA, ROE, and the financial leverage ratio, while the independent variables — underwriting risk, liquidity risk, and capital risk — were measured using the following ratios: net written premiums to shareholders' equity, liabilities to liquid assets, and available capital to required capital, respectively. The study

found a statistically significant positive relationship between liquidity risk management and financial performance when the latter was measured by the leverage ratio. Conversely, capital risk management displayed a statistically significant inverse relationship with leverage-based financial performance. Underwriting risk management, however, showed no statistically significant relationship with the financial performance of the sampled companies.

Ellis (2025) analyzed the impact of enterprise risk management (ERM) adoption on insurance product decisions and the financial stability of insurance firms. Employing a causal analytical design based on a structural model linking consumer demand to product performance, the study found that ERM implementation leads insurers to reduce high-risk guarantees, raise fees on such products, and shift toward more conservative product offerings — outcomes that collectively enhance financial stability, albeit at some cost to consumer surplus.

Fondem (2025) explored the effect of financial risk management practices on the financial performance of both life and non-life insurance companies in South Africa. Using panel data and regression models, the study assessed the impact of credit, operational, market, and liquidity risks on ROA and ROE. The findings indicated that credit risk management exerts a significant positive effect on ROA, while the remaining risk dimensions yielded positive but statistically insignificant relationships — underscoring the importance of adopting robust risk management practices to foster financial stability.

Kumar (2024) conducted a systematic review of 187 research papers spanning more than four decades, with the aim of mapping the application of ERM frameworks in the insurance industry and identifying research trends and future directions. The review concluded that ERM adoption has become increasingly widespread and is positively associated with firm value and financial performance. The study also identified notable research gaps concerning risk culture, management committees, and the relationship between ERM and return on assets.

Siyam (2024) analyzed the determinants of credit risk in Egypt's property and liability insurance sector and examined their implications for firm financial performance. Applying the Generalized Method of Moments (GMM) to insurer-level data, the study found that both macroeconomic conditions and firm-specific factors influence credit risk levels and, through this channel, affect sectoral financial performance — providing a valuable reference for analyzing technical risks and their performance implications.

Mahdid (2024) evaluated the effectiveness of risk management in the insurance sector during a health crisis and its effect on firm financial performance. Drawing on an empirical case analysis of insurance companies during periods of elevated stress associated with a global health pandemic, the study concluded that sound risk management practices helped mitigate the adverse effects of the crisis, as reflected in improved performance indicators including profitability and liquidity.

Research Gap

Despite the growing volume of international research on the relationship between financial risk management and financial performance in insurance companies, empirical studies addressing this nexus within the Algerian context remain remarkably scarce. This gap is not unique to Algeria; as Kumar (2024) noted, developing economies more broadly suffer from a paucity of research in this area.

Furthermore, the period 2016–2022 — which spans the pre-pandemic, pandemic, and post-pandemic phases of the COVID-19 crisis — offers a rare analytical opportunity to examine how exceptional macroeconomic and institutional circumstances shape this relationship. It is precisely this opportunity that the present study seeks to capitalize on, through an investigation of financial risk management indicators and their relationship with financial performance at the Société Nationale d'Assurance (SAA).

II- Theoretical Framework of Financial Risk Management

This section presents the theoretical underpinnings of financial risk management in insurance companies, outlining the key concepts, typologies of risk, and the role of risk management in safeguarding financial stability and fostering sustained performance.

1. The Concept of Financial Risk Management

Financial risk management has been defined in numerous ways across the academic and professional literature, reflecting the diversity of scholarly perspectives and regulatory bodies engaged with this field. The most prominent definitions are presented below.

Enterprise risk management (ERM) has been defined as "a rigorous and structured approach to assessing and responding to all risks that may affect the

achievement of an organization's strategic and financial objectives" (Ngwenya, 2021, p. 24).

In a related formulation, ERM is described as "a process designed to identify potential events that may affect the entity, manage risks to be within the organization's risk appetite, and provide reasonable assurance regarding the achievement of organizational objectives" (Jamilu, 2023, p. 100).

The Committee of Sponsoring Organizations of the Treadway Commission (COSO), in its 2004 Integrated Framework for Enterprise Risk Management, defines risk management as "a process, effected by an entity's board of directors, management, and other personnel, applied in strategy setting and across the enterprise, designed to identify potential events that may affect the entity, and manage risk to be within its risk appetite, to provide reasonable assurance regarding the achievement of entity objectives" (COSO, 2004).

From a broader organizational perspective, risk management has been characterized as the identification, analysis, and economic control of risks that threaten the assets or earning capacity of an enterprise (Al-Rawi, 2009, p. 10).

Within the insurance sector specifically, risk management has been defined as the process through which a company undertakes measures to assess and control the impact of past, present, and future events capable of causing harm — particularly those affecting the company's assets, liabilities, and cash-flow statement (Darwish, 2018, p. 52).

The Egyptian Financial Regulatory Authority offers a complementary institutional perspective, defining risk management as the set of systematic procedures adopted by companies to address the risks accompanying their activities, with the aim of realizing sustainable value from each activity and from the overall activity portfolio, while enabling management to understand the positive and negative contingencies that bear on the achievement of the company's general objectives (Samia, 2020, p. 54).

2. Types of Risk in Insurance Companies

The principal categories of risk to which insurance companies are exposed may be summarized as follows.

2.1. Credit Risk

Credit risk refers to the risk of default and deterioration in the creditworthiness of the issuers of securities held in the company's investment portfolio, as well as of counterparties — such as those involved in reinsurance

contracts, derivative financial instruments, or deposits — and intermediaries to which the company is exposed (Association, 2004, p. 30).

2.2. Capital Risk

Capital risk denotes the inability to meet or settle obligations, encompassing the full spectrum of risks to which an insurance company is exposed, including asset risk, credit risk, market risk, operational risk, and others. The literature consistently holds that an insurance company is considered solvent when it is capable of fulfilling its contractual obligations at any point in time. Solvency is typically measured by dividing available capital by required capital, and this ratio stands as one of the most critical financial metrics for assessing an insurer's capacity to meet its financial and contractual commitments.

2.3. Liquidity Risk

Liquidity risk is a form of financial risk, measured in the insurance context by the ratio of cash deposits to total technical provisions. A high ratio signals low liquidity risk, while a low ratio indicates elevated exposure. Total technical provisions represent the portion of funds set aside by insurance companies to cover future financial obligations to policyholders (Fondem, 2025, p. 101).

2.4. Underwriting Risk

Underwriting risk refers to losses directly associated with insurance policies. It arises when the average value of actual claims differs from the expected value at the time the policies were written, and typically stems from inadequate risk selection, inappropriate underwriting terms, mispricing, or inaccurate estimation of expected claims. Underwriting risk is commonly measured by dividing net written premiums by shareholders' equity; the higher this ratio, the greater the company's risk exposure (Zaher, 2020, p. 154).

2.5. Operational Risk

Operational risk is defined as the risk of loss resulting from inadequate or failed internal processes, personnel, or systems, or from external events (Boller, 2016, p. 4).

2.6. Actuarial Risk

Actuarial risk arises from the collection of funds through the issuance of insurance policies and other liabilities. In essence, it represents the risk that the company pays out substantially more than it collects, or conversely, that the

premiums collected are insufficient relative to the risks it has agreed to cover (Babbel, 1997, p. 239).

2.7. Market Risk

Market risk originates from the level or volatility of market prices of assets. It encompasses exposure to movements in key financial variables, including equity prices, interest rates, foreign exchange rates, and commodity prices (Alouache, 2021, p. 4).

3. The Risk Management Process in Insurance Companies

By the very nature of their business — compensating individuals and institutions for losses — insurance companies rank among the most risk-exposed entities in the financial system. This inherent exposure makes the establishment of a rigorous, structured approach to financial risk management not merely advisable, but essential to preserving institutional stability.

3.1. Definition of Insurance

The Insurance Terminology Committee of the American Risk and Insurance Association defines insurance as "the pooling of fortuitous losses by transfer of such risks to insurers, who agree to indemnify insureds for such losses, to provide other pecuniary benefits on their occurrence, or to render services connected with the risk" (Leimberg, 2016, p. 19).

3.2. The Insurance Company: Conceptual Definition

As the first party to an insurance contract, an insurance company undertakes to indemnify material losses in exchange for a single premium or a series of regularly paid premiums, the aggregate value of which does not exceed the total potential compensation.

Insurance companies are also defined as entities "licensed by public authorities and subject to mandatory accreditation to carry out specific insurance activities as stipulated in their authorization. They generally operate as commercial enterprises — most commonly as joint-stock companies, given their substantial capital requirements and long operational lifespan. They maintain a contractual relationship with their clients through the insurance coverage policies they issue, under which they commit to indemnifying the insured public upon the occurrence of covered risks" (Mahdid, 2024, p. 5).

3.3. Steps of Financial Risk Management in Insurance Companies

The general framework for risk management in insurance companies comprises a set of sequential, interrelated steps, the most important of which are outlined below.

a. Risk Identification

This initial stage involves identifying all potential risks that may affect the organization. A range of methods is employed to this end, most notably brainstorming sessions and reviews of past experience. The relevant information is gathered from diverse sources and subsequently classified into internal and external risks, thereby facilitating the analysis and management of each category.

b. Risk Assessment (Measurement)

Risk assessment entails ranking identified risks according to their severity and probability of occurrence — categorizing them as high, medium, or low. This is carried out by comparing potential risks against the organization's established risk tolerance criteria, enabling the prioritization of risks so that each may be addressed through an appropriately tailored response.

c. Risk Treatment (Response)

At this stage, the organization implements a series of measures aimed at managing identified risks. The available responses include risk mitigation — reducing the adverse impact of a risk — risk avoidance, risk transfer to a third party, or risk acceptance where the potential impact is deemed limited (George, 2018, p. 977).

d. Risk Monitoring

Risk monitoring requires the company to maintain an effective oversight structure that ensures compliance with established risk standards and limits, and that formally documents any approved changes. This involves the implementation of clear procedures for investigating instances of non-compliance in order to prevent their recurrence, alongside the active role of supervisory and internal audit committees in communicating the consequences of non-compliance (Sayed, 2018, pp. 53–54).

III- Financial Performance Evaluation

Financial performance is a subject of considerable and enduring interest in the economics and finance literature, engaging scholars across dimensions of conceptualization, measurement, and determinant analysis.

1. The Concept of Financial Performance

The literature on performance and its determinants is relatively rich, with scholarly attention focused on several interconnected aspects: the conceptual definition of performance, its measurement, the analysis of efficiency and effectiveness, and the identification of firm-level performance determinants.

1.1. Defining Financial Performance

Financial performance may be defined as a company's capacity to generate profits and deliver value to its various stakeholders, through the design of products or services that meet stakeholder expectations.

More broadly, financial performance can be understood as the aggregate outcomes of an organization's activities or investments over a given period, expressed through benchmarks, indicators, or inter-firm comparisons. The selection of key performance indicators for a firm's core activities — those that meaningfully capture financial performance — is both a challenging and critically important step in the analytical process.

1.2. Financial Performance Evaluation

Financial performance evaluation serves as the foundation for understanding an organization's current performance levels and identifying deviations between actual outcomes and targeted benchmarks. This process enables firms to pinpoint areas of strength and weakness, and to make evidence-based strategic decisions.

1.3. Financial Performance Improvement

Improving financial performance builds directly on the results of measuring and analyzing performance indicators, which together provide the diagnostic basis for identifying strengths and deficiencies within financial institutions. To develop meaningful improvement plans, organizations must take corrective action by detecting performance gaps, tracing their origins and root causes, and systematically working to eliminate them. Crucially, any improvement initiative must remain calibrated to the resources available for its implementation. In this sense, financial performance improvement is best understood as the natural outcome of a rigorous cycle of evaluation and measurement (Zaher, 2020, p. 155).

2. Measuring Financial Performance

Financial performance measurement ranks among the most important tools in financial analysis, serving to assess a firm's capacity to generate profits and deploy its resources efficiently. Researchers and analysts draw on a range of

indicators, which are broadly grouped into two categories: accounting-based measures and market-based financial measures.

2.1. Accounting-Based Measures

These are financial ratios derived from the balance sheet and income statement, most notably return on assets (ROA), return on equity (ROE), and return on investment (ROI).

2.2. Market-Based Financial Measures

Market-based measures rely on capital market indicators, such as the price-to-earnings (P/E) ratio. Some measures blend both accounting and market dimensions — Tobin's Q being the most prominent example, as it combines market value with book value (Qatofi & Mohammed, 2020, p. 346).

3. Financial Performance Indicators

Financial performance is assessed through a set of ratios and indicators that collectively reflect the financial health and operational effectiveness of an organization. These include the following.

a. Profitability Ratios

Profitability ratios measure the extent to which a firm succeeds in controlling costs and generating profit from its operations. They are designed to examine and compare an organization's earning capacity, shedding light on the efficiency with which it has conducted its activities over prior periods. In particular, these ratios clarify the rate of return on invested capital provided through equity (Laslous, 2004, p. 48).

b. Liquidity Ratios

Liquidity ratios are intended to evaluate a firm's short-term capacity to meet its obligations. This is accomplished by comparing the totality of short-term assets against short-term liabilities, thereby assessing the adequacy of liquid resources relative to immediate financial commitments.

c. Activity Ratios (Operational Efficiency Ratios)

Activity ratios measure how effectively management deploys the firm's assets — across varying degrees of liquidity — relative to the maturity profiles of its liabilities. More specifically, they reveal the efficiency with which management generates sales from the asset base, offering a measure of how productively available resources are being utilized (Miloud, 2017, p. 39).

d. Financial Leverage Ratios

Leverage ratios serve as instruments for evaluating a firm's ability to meet its long-term obligations. They also assess the effectiveness of the financing policies adopted by the organization, particularly in terms of the balance struck between internal and external funding sources, and the implications of that balance for financial leverage risk (Mattar, 2006, p. 39).

IV- Empirical Analysis

1. Study Sample

The Société Nationale d'Assurance (SAA) was selected as the subject of this field study by virtue of its leading position in the Algerian insurance market. The company was established in 1963 as a joint venture between Algeria and Egypt, before the Egyptian stake was nationalized in 1966, transforming SAA into a fully national institution. In 1989, the company transitioned to a financially autonomous entity. Today, SAA operates an extensive network of approximately 495 agencies spanning the country's various regions, with a workforce of around 4,620 employees.

1.1. Data Sources

The study draws on an analysis of the company's financial statements over the period 2016–2022, supplemented by an interview conducted with the Deputy Head of the Risk Identification and Assessment Department.

1.2. Analytical Tools

IBM SPSS Statistics was employed for data analysis, utilizing the following techniques :

Descriptive statistics : mean, standard deviation, minimum, and maximums valus.

Correlation analysis : Pearson's correlation coefficient, used to measure the strength and direction of the relationships between study variables.

2. Descriptive Statistics for Study Variables

The descriptive analysis of the financial risk and financial performance variables for the Société Nationale d'Assurance (SAA) over the period 2016–2022 is presented in Table 1.

Table 1: Statistical Characteristics of the Study Variables for the Period 2016–2022

Variable	Mean	Standard Deviation	Maximum	Minimum	Normative Observations
Liquidity Risk	48.35%	10.19%	61.5%	33%	Within the standard benchmark range (40–60%), indicating the company's ability to cover its short-term obligations.
Underwriting Risk	45.07%	1.67%	47.5%	43%	A standard deviation of 27% indicates the company's capacity to absorb unexpected losses, with the highest value recorded in 2021.
Capital Risk	3.92%	3.72%	9.5%	0%	It ensures financial solvency and business continuity.
ROA	3.24%	0.39%	3.81%	2.59%	It falls within acceptable performance levels in the insurance sector.
ROE	7.5%	1.23%	9.12%	5.77%	It reflects the company's ability to generate satisfactory returns for shareholders.
Equity Multiplier	2.31	0.16	2.65	2.19	It indicates a moderate reliance on debt financing and a stable financial structure.

Source : Author compilation based on SPSS output.

The descriptive analysis of the financial risk and financial performance variables for the Société Nationale d'Assurance (SAA) over the period 2016–2022 reveals that risk levels vary considerably across risk categories, while performance indicators display relative stability. The findings are summarized as follows.

Liquidity Risk

The mean liquidity risk ratio stood at 48.35%, with a standard deviation of 10.19%, and values ranging between 33% and 61.5%. These levels fall within the generally accepted range for the insurance sector — typically between 40% and 60% — reflecting the company's capacity to cover its short-term obligations, notwithstanding some year-to-year variation.

Underwriting Risk

The mean underwriting risk ratio was 45.07%, with a standard deviation of 27%, suggesting that the company is capable of absorbing unexpected losses, as the recorded ratios remain within the industry's conventional benchmarks. The

highest underwriting risk value of 47.5% was recorded in 2021, indicating elevated risk exposure relative to other years, while the lowest value of 43% was observed in 2016, pointing to relative stability in underwriting policy.

Capital Risk

The mean capital risk ratio was 3.92%, with some inter-annual variation. While this points to a degree of fluctuation in the financing structure, the ratios nonetheless remain within the thresholds that ensure solvency and the sustainability of the company's operations.

Financial Performance Indicators

Return on Assets (ROA): The mean ROA was 3.24%, with a standard deviation of 0.39%. This falls within the acceptable range for the insurance sector, which is generally considered to lie between 2% and 5%.

Return on Equity (ROE): The mean ROE was 7.5%, with a standard deviation of 1.23%, reflecting the company's ability to generate satisfactory returns for shareholders in line with sector benchmarks, which typically range from 6% to 12%.

Equity Multiplier: The mean equity multiplier was 2.31, with a notably low standard deviation of 0.16. This indicates a moderate reliance on debt financing and a stable financial structure consistent with insurance sector norms.

Taken together, these findings suggest that SAA maintains acceptable levels of financial performance alongside a sound capacity to manage its principal financial risks — particularly underwriting and liquidity risks. This reflects the effectiveness of the company's financial risk management practices and the degree to which its risk strategies contribute to sustaining financial performance stability and reinforcing institutional solvency.

3. Analysis of the Relationships Between Study Variables

Pearson's correlation coefficient (r) was employed to examine the relationships between the study variables.

First: Analysis of Relationships Among Independent Variables

The following table presents the correlation results among the study's independent variables.

Table 2: Pearson Correlation Matrix for Independent Variables

Variable	Liquidity Risk	Underwriting Risk	Capital Risk	Equity Multiplier
Liquidity Risk	1	0,681583	-0,729168	-0,725363
Underwriting Risk	0,681583	1	-0,944226	-0,565369
Capital Risk	-0,729168	-0,944226	1	0,743441
Equity Multiplier	-0,725363	-0,565369	0,743441	1

Source: Author compilation based on SPSS output.

The correlation coefficients reported in Table 2 are interpreted as follows.

Liquidity Risk and Underwriting Risk

The Pearson correlation coefficient between liquidity risk and underwriting risk was r = 0.682, significant at the 0.042 level, indicating a moderate-to-strong statistically significant positive relationship between the two variables. This finding suggests that as the company increases its underwriting activity — thereby assuming greater risk exposure — it tends to maintain higher liquidity levels as a precautionary buffer.

Liquidity Risk and Capital Risk

The correlation coefficient between liquidity risk and capital risk was r = −0.729, significant at the 0.033 level, revealing a strong and statistically significant inverse relationship. Specifically, as the liquidity ratio increases, capital risk tends to decline, which reflects a trade-off between retaining liquid assets and deploying capital for investment purposes.

Underwriting Risk and Capital Risk

This pair yielded the largest correlation coefficient in the analysis, with r = −0.944, significant at the 0.001 level — pointing to a very strong and statistically significant inverse relationship between underwriting risk and capital risk. This result implies that an expansion in underwriting activity, that is, the acceptance of new risks, is associated with a reduction in available capital. Such a finding is consistent with the inherent dynamics of insurance operations, whereby capital is utilized to support and underwrite insurance activities.

Second: Analysis of the Interrelationships Between Risk Management Variables

The following table presents the Pearson correlation results between the independent and dependent variables of the study.

Table 3: Pearson Correlation Between Independent and Dependent Variables

Variable	ROA	ROE	Observations
Liquidity Risk	-0.802	-0.894	Strong negative relationship, significant at the 0.05/0.01 level; Higher liquidity reduces financial performance**.**
Underwriting Risk	-0.518	-0.629	Moderate negative relationship, significant at the 0.05 level; Higher underwriting risk reduces returns
Capital Risk	0.582	0.755	Moderate to strong positive relationship, significant at the 0.05 level; Greater capital adequacy supports returns.
Equity Multiplier	0.434	0.754	Positive relationship, significant at the 0.05 level; Moderate financial leverage enhances ROE.

Source: Author compilation based on SPSS output.

The findings presented in Table 3 are analyzed as follows.

- The Relationship between Liquidity Risk and Return on Assets (ROA)

The Pearson correlation coefficient between liquidity risk and ROA was r = −0.802, significant at the 0.030 level, indicating a strong negative relationship. This result suggests that increases in liquidity risk reduce asset utilization efficiency, as inadequate liquidity constrains the company's ability to deploy its assets productively.

- The Relationship between Liquidity Risk and Return on Equity (ROE)

The correlation between liquidity risk and ROE was r = −0.894, significant at the 0.007 level — a very strong inverse relationship. This implies that higher liquidity risk materially erodes shareholder returns, and serves as an important indicator of the extent to which liquidity conditions influence overall profitability.

- The Relationship between Underwriting Risk and Return on Assets (ROA)

The correlation coefficient between underwriting risk and ROA was r = −0.518, significant at the 0.034 level, reflecting a moderate inverse relationship. This finding indicates that rising underwriting risk is associated with declining asset returns, consistent with the inherent loss exposure embedded in insurance contract obligations.

- The Relationship between Underwriting Risk and Return on Equity (ROE)

The correlation between underwriting risk and ROE was r = −0.629, significant at the 0.030 level — a moderate negative relationship — suggesting that heightened underwriting risk progressively diminishes shareholder value and earnings distributions.

- The Relationship between Capital Risk and Return on Assets (ROA)

The correlation coefficient between capital risk and ROA was r = 0.582, significant at the 0.002 level, indicating a moderate positive relationship. This result is interpreted as evidence that an increase in available capital enhances the company's capacity to absorb risk effectively, thereby improving asset return performance.

- The Relationship between Capital Risk and Return on Equity (ROE)

The correlation between capital risk and ROE was r = 0.755, significant at the 0.050 level — a strong positive relationship — demonstrating that adequate capitalization supports shareholder returns and reduces the likelihood of significant losses.

- The Relationship between Equity Multiplier Risk and Return on Assets (ROA)

The correlation between the equity multiplier and ROA was r = 0.434, significant at the 0.030 level, indicating a moderate positive relationship. This finding suggests that a moderate reliance on financial leverage contributes positively to asset investment efficiency, reflecting a balanced financing policy that is conducive to improved financial performance.

- The Relationship between Equity Multiplier Risk and Return on Equity (ROE)

The correlation between the equity multiplier and ROE was r = 0.754, significant at the 0.050 level — a strong positive relationship. This result is consistent with capital structure theory and the DuPont decomposition framework, which formally links financial leverage to ROE. Notably, the effect of financial leverage is more pronounced on shareholder returns (ROE) than on asset investment efficiency (ROA), an outcome that aligns with the financial logic governing insurance company operations.

Taken together, the findings lead to the following conclusions.

The negative relationships between risk exposures — specifically liquidity and underwriting risks — and financial performance are consistent with established insurance sector benchmarks. Both risk categories directly impair the company's ability to meet its obligations and generate profits.

Conversely, the positive relationships between capital risk, the equity multiplier, and financial performance indicate that prudent capital investment and moderate leverage management can enhance returns, in a manner consistent with the operational model of insurance firms.

Liquidity and underwriting risks exert a clear adverse effect on both ROA and ROE, making them critical variables in insurance company management. Capital adequacy and the equity multiplier, meanwhile, reinforce financial performance when risks are effectively controlled — with the impact of financial leverage manifesting more distinctly in shareholder returns (ROE) than in asset utilization efficiency (ROA).

Discussion of Results and Hypothesis Testing

The study hypotheses were tested using the financial data of the **National Insurance Company (Société Nationale d'Assurance, SAA)** for the period 2016–2022. Both **Pearson correlation analysis** and related **statistical techniques** were employed to evaluate the impact of financial risk management indicators on financial performance, as measured by Return on Assets (ROA) and Return on Equity (ROE). The results were as follows:.

First Hypothesis : "There is a statistically significant relationship between liquidity risk and financial performance."

Pearson correlation analysis revealed a **strong negative** association between liquidity risk and both ROA ($r = -0.802$, $p = 0.030$) and ROE ($r = -0.894$, $p = 0.007$). These results indicate that elevated liquidity risk reduces asset investment efficiency and weakens returns distributed to shareholders. On the basis of these findings, **the first hypothesis is accepted**, underscoring the critical role of liquidity management in enhancing financial performance and sustaining the stability of insurance companies.

Second Hypothesis :"There is a statistically significant relationship between underwriting risk and financial performance."

The Pearson correlation analysis revealed a **moderate negative** association between underwriting risk and both ROA ($r = -0.518$, $p = 0.034$) and ROE ($r = -0.629$, $p = 0.030$). These results indicate that higher underwriting risk levels reduce financial performance effectiveness and adversely affect shareholder returns. Accordingly, **the second hypothesis is accepted**, highlighting the importance of underwriting risk management for maintaining profitability and financial stability in insurance operations.

Third Hypothesis : "There is a statistically significant relationship between capital risk and financial performance."

The analysis revealed a **positive association** between capital risk and both ROA ($r = 0.582$, $p = 0.002$) and ROE ($r = 0.755$, $p = 0.050$). These results reflect the fact that greater capital availability strengthens the company's solvency position and enhances its capacity to generate higher returns on both assets and

equity. **The third hypothesis is therefore accepted**, confirming the pivotal role of capital adequacy in reinforcing financial performance and institutional stability.

Main Hypothesis : "There is a statistically significant relationship between financial risk management and financial performance."

Drawing on the combined evidence from the three sub-hypotheses concerning liquidity, underwriting, and capital risks, the analysis points to a clear and statistically meaningful relationship between financial risk management and the financial performance of SAA over the period 2016–2022. All three sub-hypotheses confirmed a significant effect of risk management on financial performance outcomes. **The main hypothesis is accordingly accepted**, affirming the central role that balanced financial risk management plays in improving financial stability and enhancing the profitability of insurance companies.

V- Conclusion

The findings of this study demonstrate a significant effect of financial risk management on the financial performance of SAA over the period 2016–2022, with considerable variation in the strength of the relationships depending on the nature of each risk category. The three sub-hypotheses collectively confirmed meaningful associations between the financial risk variables — liquidity, underwriting, and capital — and the financial performance indicators ROA and ROE.

- Liquidity Risk exhibited a strong negative relationship with both ROA ($r = -0.802$) and ROE ($r = -0.894$), reflecting the classic liquidity-profitability trade-off that insurance companies routinely navigate. Notably, the effect was more pronounced on ROE than on ROA, suggesting that liquidity constraints extend beyond mere asset investment efficiency to directly erode shareholder returns through the financial leverage mechanism. These findings are broadly consistent with those of Al-Tarawna (2015) and Fondem (2025) regarding the impact of internal firm-level factors on performance.

They diverge, however, from Zaher (2020), who found a positive relationship — a discrepancy that is readily explained by contextual differences: Zaher's study was conducted in the Damascus market during the Syrian crisis, a setting in which liquidity assumed an exceptional precautionary function that superseded ordinary return considerations.

- Underwriting Risk was found to have a moderate negative relationship with financial performance (ROA: −0.518; ROE: −0.629). The moderate — rather

than strong — magnitude of this relationship reflects the relative stability of the company's underwriting policies, as evidenced by a standard deviation of just 1.67%, suggesting that SAA has succeeded in constructing a stable risk portfolio that mitigates the severity of adverse performance effects. This finding aligns with Ellis et al. (2025) on the tendency of ERM systems to shift toward more conservative product offerings, and is consistent with Seyam et al. (2024) on the influence of internal factors on performance outcomes.

- Capital Risk displayed a positive relationship with financial performance, though with a notable differential in strength between ROA (0.582) and ROE (0.755). This divergence reflects the transmission mechanism operating through the financing structure: capital reinforces solvency, thereby enabling more effective asset deployment (ROA), while its impact on shareholder returns (ROE) is amplified through financial leverage. This finding is in line with Kumar, Rao & Barai (2024) regarding the positive effect of ERM adoption on firm value.

- The Equity Multiplier showed a stronger positive relationship with ROE (0.754) than with ROA (0.434), lending empirical support to the DuPont decomposition framework, which disaggregates return on equity into three constituent components. The mean equity multiplier of 2.31 falls within the range in which the positive effect of financial leverage is maximized, consistent with optimal capital structure theory.

On the whole, these findings suggest that SAA operates an effective risk management system that strikes a meaningful balance between liquidity and profitability. The stability of its underwriting policies, combined with prudent capital utilization and moderate financial leverage, have collectively contributed to sustaining and reinforcing the company's financial performance throughout the study period.

Recommendations

In light of the study's findings on the impact of financial risk management indicators on SAA's financial performance over the period 2016–2022, the following recommendations are put forward.

Insurance companies should strengthen their financial risk management systems by adopting integrated mechanisms for risk identification, measurement, and monitoring — an investment that would contribute meaningfully to financial stability and performance enhancement.

A more effective balance between liquidity and profitability should be pursued through disciplined financial resource management, ensuring that short-

term obligations are met while financial surpluses are channeled into investment activities capable of generating adequate returns.

Underwriting policies ought to be developed further by embracing more sophisticated models for risk assessment and pricing, thereby limiting the exposure associated with accepting elevated risks without commensurate premium levels.

Strengthening the capital base and employing financial leverage judiciously would enhance insurers' resilience to financial volatility and support the delivery of sustainable returns to shareholders.

Finally, further empirical research on the Algerian insurance sector is encouraged, in order to deepen the scholarly understanding of the relationship between financial risk management and financial performance within this specific institutional context.

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