

# ZENITH GENERAL INSURANCE COMPANY LIMITED

FINANCIAL CONDITION REPORT FOR NON-LIFE  
BUSINESS AS AT  
31<sup>ST</sup> DECEMBER 2023



Building a better  
working world

## EXECUTIVE SUMMARY

This report provides an overview of the Financial Condition of the Company. We also understand that this report will form part of the Company's submission to NAICOM. The report has been prepared in accordance with the General Insurance Business Actuarial Reports Guidance Notes (GN12v5.0) published by the Institute and Faculty of Actuaries.

**The following are the key conclusions of the report.**

- ▶ Overall, this report demonstrates that the Company remains adequately capitalized with a strong and conservative investment portfolio to support current and projected liabilities while maintaining compliance with regulatory requirements.
- ▶ As at 31st December 2023, the business had a netbook Value of N52.49billion or 1750% of the statutory minimum capital of N3billion. Hence the business is well capitalized from the current regulatory point of view.
- ▶ We estimate the economic/risk-based capital required to support the business at 31st December 2023 as N8.94 billion, a coverage of 589% of the shareholder Funds of N52.49 billion. The company thus holds a cushion above its economic capital which enhances its ability to meet its obligations to policyholders in adverse scenarios.
- ▶ We note that the company has maintained a well-balanced mix and has not been exposed to concentration risk.

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Lagos.

April 2024

## FINANCIAL CONDITION REPORT FOR NON-LIFE BUSINESS AS AT 31<sup>ST</sup> DECEMBER 2023

Dear Sir,

### Introduction, Purpose and Limitations

1.1 We are pleased to present our Financial Condition Report ("FCR") for **Zenith General Insurance Company Limited** ('the Company') as at 31st December 2023.

#### Purpose:

1.2 This report sets out the outcome of our assessment of the criteria stipulated in the Guidance note (GN12v5.0), issued by the Institute and Faculty of Actuaries, to the extent relevant to Zenith General Insurance Company Limited for the year ended 31st December 2023.

1.3 This report is prepared solely for the purpose of providing an overview of the current financial condition of the Company. We understand that this report will form part of your submission to NAICOM. This report is not to be used for any other purpose other than that described above and should not be distributed to any other parties other than NAICOM.

#### Limitations:

1.4 Management is solely responsible for the contents and submission of the Financial Conditions Report in accordance with Guidance Note GN12V5.0

1.5 Because our assessment does not constitute either an audit or a review made in accordance with International Standards on Auditing or International Standards on Review Engagements (or relevant national standards or practices), we do not express any assurance on the financial statements, the financial conditions or the ability of the entity to continue as a going concern for the foreseeable future.

1.6 Had we performed additional procedures, or had we performed an audit or review of the financial statements in accordance with International Standards on Auditing or International Standards on Review Engagements (or relevant national standards or practices), other matters might have come to our attention that would have been reported to you.

1.7 Our report has been prepared based on certain assumptions and is subject to certain limitations. These have been described in Appendix 1 - Reliance and Limitations.

## 2. Developments in the Business

2.1 We illustrate in the table below how Zenith's books have developed over the year 2022 to 2023.

	2023	2022	YoY Movement
Insurance Revenue	17,442,401	13,067,774	33.48%
Insurance Service Expense	(7,477,481)	(4,833,115)	54.71%
Net expenses from reinsurance contracts held	(3,963,384)	(3,511,485)	12.87%
<b>Insurance Service Result</b>	<b>6,001,536</b>	<b>4,723,174</b>	<b>27.07%</b>
<b>Investment Return</b>	<b>22,316,704</b>	<b>4,771,145</b>	<b>367.74%</b>
Net insurance finance expenses	(728,953)	(729,767)	-0.11%
Other Income	73,505	35,687	105.97%
Other Operating Expenses	(4,564,392)	(3,723,140)	22.60%
<b>Profit before Tax</b>	<b>23,098,400</b>	<b>5,077,099</b>	<b>354.95%</b>
Income Tax	(1,365,954)	(316,030)	332.22%
<b>Profit after Tax</b>	<b>21,732,446</b>	<b>4,761,069</b>	<b>356.46%</b>

We note that insurance revenue increased by 33.48% from 2022 to 2023.

There was a significant increase in profit after tax by 356.46% which was mainly driven by the significant increase in investment return.

## 3. Business Overview

### 3.1 Premium History

Gross Written Premium (GWP) has increased with an average of 20.8% over the years under review.

Line of Business	2021		2022		2023	
	₦' 000	%	₦' 000	%	₦' 000	%
Motor	2,662,262	20.3%	3,414,996	23.5%	5,220,231	27.5%
Accident	2,447,116	18.7%	2,588,791	17.8%	3,223,062	17.0%
Bond	528,793	4.0%	723,366	5.0%	800,763	4.2%
Marine	1,777,068	13.6%	1,661,475	11.4%	2,247,614	11.8%
Aviation	38,379	0.3%	37,666	0.3%	23,026	0.1%
Fire	2,518,651	19.2%	2,929,994	20.1%	3,554,498	18.7%
Engineering	903,482	6.9%	1,274,279	8.8%	1,020,610	5.4%
Oil & Gas	2,238,897	17.1%	1,910,379	13.1%	2,916,588	15.3%
<b>Total</b>	<b>13,114,648</b>	<b>100.0%</b>	<b>14,540,946</b>	<b>100.0%</b>	<b>19,006,392</b>	<b>100.0%</b>
<b>% Increase (YoY)</b>			<b>11%</b>		<b>31%</b>	

Line of Business	2022	2023	YoY Movement
Motor	3,414,996	5,220,231	53%
Accident	2,588,791	3,223,062	25%
Bond	723,366	800,763	11%
Marine	1,661,475	2,247,614	35%
Aviation	37,666	23,026	-39%
Fire	2,929,994	3,554,498	21%
Engineering	1,274,279	1,020,610	-20%
Oil & Energy	1,910,379	2,916,588	53%
<b>Total</b>	<b>14,540,946</b>	<b>19,006,392</b>	<b>31%</b>

3.1.1 The GWP increased for all the lines of business from 2022 to 2023 except for Engineering and Aviation leading to a total increase of 31% between the years.

The main drivers of growth are the Motor, Marine, and Oil & Gas classes of business.

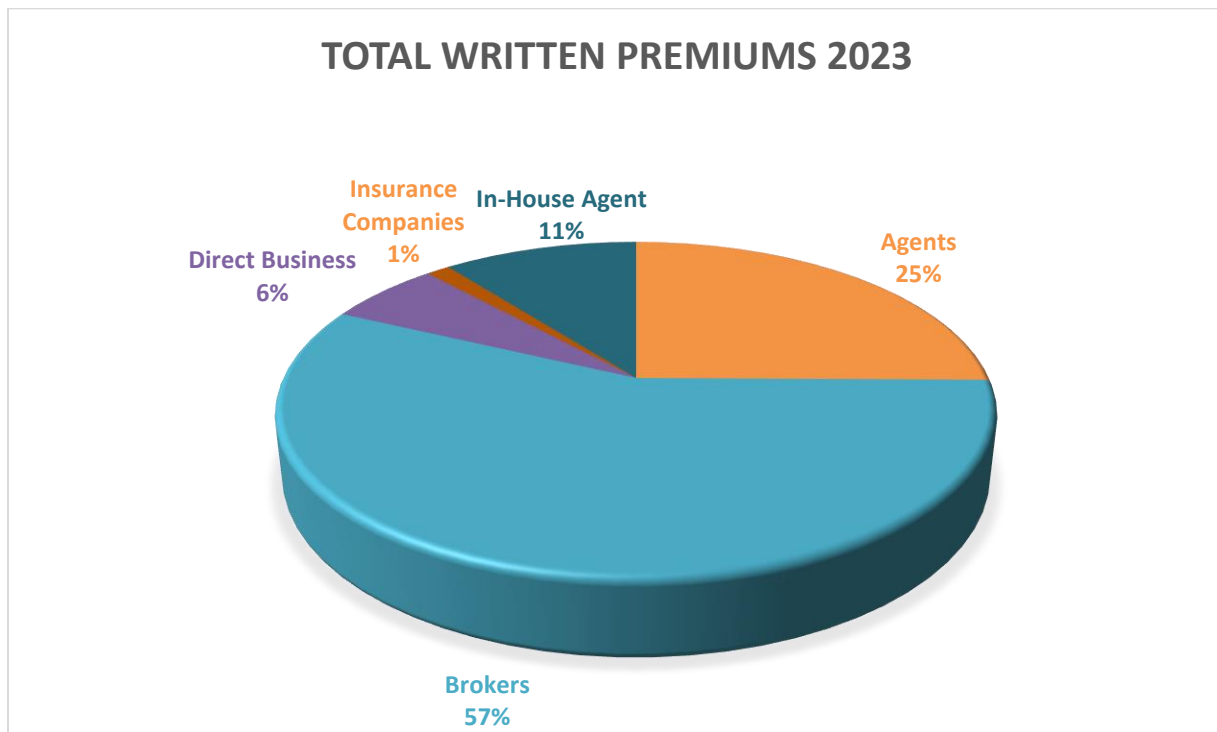
3.1.2 The Motor line of business has consistently contributed the highest to the GWP in the years under review.

3.1.3 We note that Zenith has maintained a well-diversified underwriting portfolio.

## 3.2 Distribution Channel

The chart below indicates four channels through which gross written premiums are channeled in.

Experience data shows that a significant proportion of business written by Zenith came through Brokers which contributed 57% of the total Gross Written Premiums. A total of 36% of the GWP was channeled in by Agents which constitutes Agents (25%) and In-house agents (11%). While 1% was channeled by Insurance companies. And direct business also contributed 6% of the total gross written premium. This is illustrated in the graph below:



### 3.3 Financial Performance

3.3.1 We illustrate below that the company's return on equity as published in the Annual Financial Statements were equivalent to the risk-free rate for 2021 and 2022. 2023 experienced a return on equity which was higher than the risk-free rates.

Year	Shareholders Fund ₦'000	Return on Equity (as published in the Accounts) %	Risk Free Rate %
2021	30,870,562	12%	12%
2022	33,788,353	14%	14%
2023	52,488,472	41%	20%



## 4. Pricing & Premium Adequacy

We illustrate in the table below how premium income has been utilised from 2020 to 2022.

	2022 Restated N'000	2023 N'000
Net Insurance Revenue	7,637,196	10,135,357
Net Claims Incurred & Attributable expenses	(2,180,004)	(3,029,367)
Net Amortization of acquisition cashflows	(811,083)	(1,027,390)
Investment Income	3,451,645	4,442,322
Claims and attributable expense ratio	29%	30%
Acquisition expense ratio	11%	10%
<b>Combined ratio</b>	<b>40%</b>	<b>40%</b>
Investment income	45%	44%

We illustrate in the table above that claims and attributable expense ratio and Acquisition expense ratio experienced a 1% change from 2022 to 2023. This resulted in the combined ratio remaining stable at 40% for both years.

The investment income as a percentage of Net Premium Income has also remained fairly constant from 2022 to 2023.

Metric	Definition
Claims & Attributable Expense Ratio	Net Claims Incurred & Attributable expenses / Net Insurance Revenue
Acquisition Expense Ratio	Acquisition Expenses / Net Insurance Revenue
Combined Ratio	Sum of Claims Incurred & Attributable Expense and Acquisition expense ratios
Investment Income	Investment Income / Net Insurance Revenue

## 5. Assets and Liabilities Management

### 5.1 Insurance Liability

We illustrate in the tables below the Gross Reserves of N 12.22 billion, Reinsurance Assets of N3.9 billion giving a Net Reserve of N8.25 billion.

Reserves	Gross Reserve (N'000)	Reinsurance Assets (N'000)	Net Reserve (N'000)
LIC	6,130,912	(2,866,796)	3,264,116
LRC	6,092,188	(1,106,883)	4,985,305
<b>Total</b>	<b>12,223,100</b>	<b>(3,973,679)</b>	<b>8,249,421</b>

### 5.2 Insurance Assets

We illustrate below that the company holds short-term assets i.e. Cash and Cash equivalents with leading banks and financial institutions to back its insurance fund. Zenith also has reinsurance assets from which are expected payments from leading reinsurers in respect of the technical reserves stated in section 3.1.

Assets	Insurance Funds			
	2023 (N'000)	%	Regulatory Maximum	Meet Requirement
Investment securities:				
Investment securities - amortized cost	10,292,562	72%	Minimum of 35% of Policyholders fund.	Yes
Reinsurance Assets	3,974,379	28%	Minimum of 20% of Policy holders funds.	Yes
<b>Total</b>	<b>14,266,941</b>	<b>100%</b>		

Whilst we have not carried out a risk analysis, this investment strategy ensures liquidity and meets the liability profile.

The liquid nature of the asset portfolio matches well to the short-term nature of the business' technical liabilities. We are thus of the view that this asset mix ensures that liabilities will be met as they arise.

## 6. Capital Management & Adequacy

### 6.1.1 Balance Sheet Solvency

We illustrate in the table below that from 2021 to 2023, the company has a more than sufficient balance sheet solvency ratio.

Year	2021 (N'000)	2022 (N'000)	2023 (N'000)
Technical Liabilities (Net of Reinsurance)	6,910,572	8,484,778	8,248,721
Shareholders Fund (Free Assets)	30,974,797	33,939,196	52,488,472
<b>Balance Sheet Solvency Ratio</b>	<b>448%</b>	<b>400%</b>	<b>636%</b>

The solvency ratios give comfort that liability obligations will be met when they fall due. We highlight the regulatory solvency position below and discuss risk-based solvency in section 8.

### 6.1.2 Regulatory Solvency

We show in the table below that the company's admissible assets exceeded the regulatory capital requirement of N3bn throughout the 3 years under review.

Year	2021 (N'000)	2022 (N'000)	2023 (N'000)
Technical Liabilities (Net of Reinsurance)	6,910,572	8,484,778	8,248,721
Free Assets (allowing for admissible rules)	30,824,333	34,298,890	52,402,695
Minimum Capital Requirement	3,000,000	3,000,000	3,000,000
<b>Capital Adequacy Ratio (CAR)</b>	<b>1027%</b>	<b>1143%</b>	<b>1747%</b>
<b>Regulatory Solvency Ratio</b>	<b>446%</b>	<b>404%</b>	<b>635%</b>

The below table demonstrates how the Capital Adequacy Ratio and Regulatory Solvency ratio would be materially impacted should claim ratio increase by 20%.

Year	2023 - Stressed (N'000)	2023 (N'000)
Technical Liabilities (Net of Reinsurance)	9,360,099	8,248,721
Free Assets (allowing for admissible rules)	51,291,317	52,402,695
Minimum Capital Requirement	3,000,000	3,000,000
<b>Capital Adequacy Ratio (CAR)</b>	<b>1710%</b>	<b>1747%</b>
<b>Regulatory Solvency Ratio</b>	<b>548%</b>	<b>635%</b>

While the regulatory solvency ratio falls to 353%, the Company would still meet its minimum capital requirement in the event of this extreme scenario.

#### DEFINITIONS

Metric	Definition
Capital Adequacy Ratio (CAR)	Free Assets/Minimum Capital Requirement
Balance Sheet Solvency Ratio	Shareholders' Funds/Technical Reserves
*Regulatory Solvency Ratio	Free Assets/Technical Reserves

\*Free assets include allowance for admissibility rules

## 6.1 Stress Scenario for 2023 Results

6.1.1 The below table demonstrates that the solvency margin would be materially impacted should the net claim ratio increase by 5%, 10% and 20% respectively.

Year	2023 - Stressed (N'000)	2023 (N'000)
Technical Liabilities (Net of Reinsurance)	8,526,565	8,248,721
Shareholders Fund (Free Assets)	52,210,628	52,488,472
<b>Balance Sheet Solvency Ratio</b>	<b>612%</b>	<b>636%</b>

Year	2023 - Stressed (N'000)	2023 (N'000)
Technical Liabilities (Net of Reinsurance)	8,804,410	8,248,721
Shareholders Fund (Free Assets)	51,932,783	52,488,472
<b>Balance Sheet Solvency Ratio</b>	<b>590%</b>	<b>636%</b>

Year	2023 - Stressed (N'000)	2023 (N'000)
Technical Liabilities (Net of Reinsurance)	9,360,099	8,248,721
Shareholders Fund (Free Assets)	51,377,094	52,488,472
<b>Balance Sheet Solvency Ratio</b>	<b>549%</b>	<b>636%</b>

The above stress tests shows that the Company's Balance Sheet Solvency ratio would still be above 380% even at a 20% net increase in loss ratio across the whole account, which is considered an extreme scenario. This shows the resilience of the Company's Balance Sheet to short-term shocks, demonstrating a strong financial condition.

## 6.2 Economic Capital

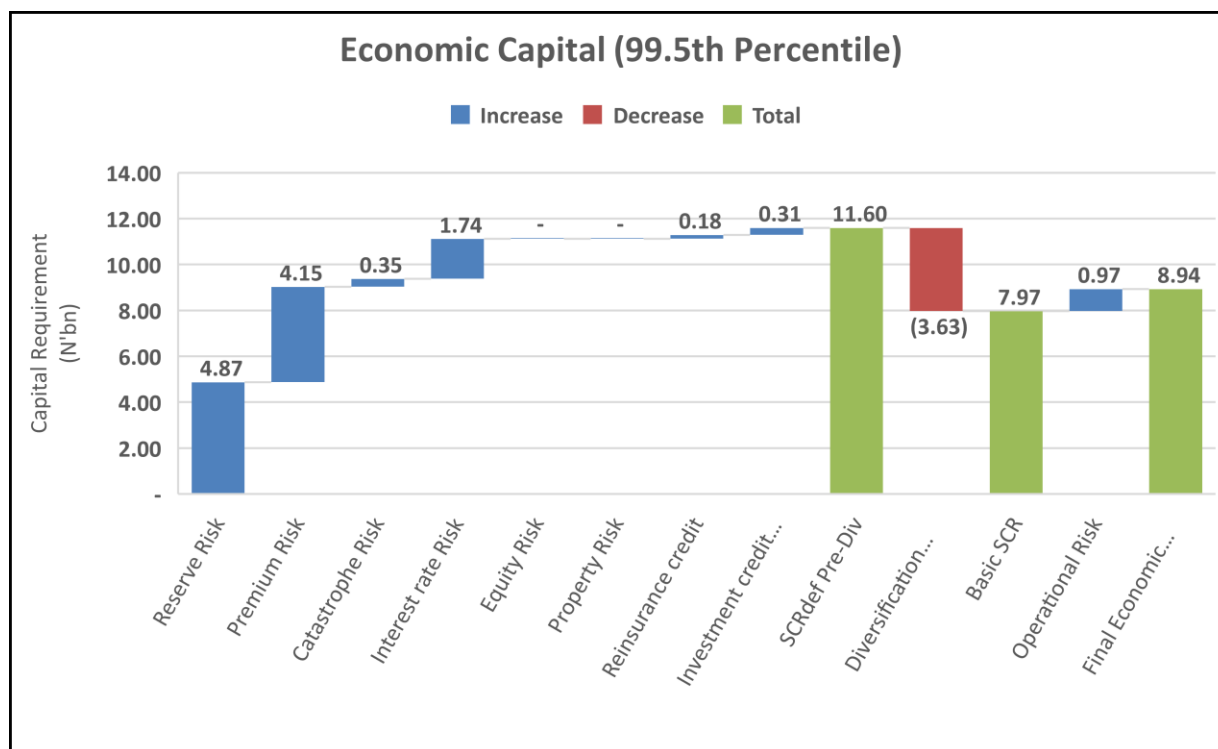
- 6.2.1 The technical figures (technical liabilities, reinsurance assets, etc.) estimated for balance sheet purposes are our 'best' estimate and broadly reflect the 'mean' of possible outcomes. However, in the course of time these estimates may fluctuate adversely as a result of unexpected realities.
- 6.2.2 It is prudent and best practice to estimate the extent to which the best estimate can be exceeded due to possible adverse situations and establish the corresponding risk capital, called economic capital. This is the amount of capital that a financial company requires to stay solvent given the riskiness of its assets and operations.
- 6.2.3 The key risks the company is exposed to are underwriting risk, market risk, counterparty risk and operational risk, they are described and discussed in appendix 6 of the report.
- 6.2.4 We have calculated for each of the risks, the amount of capital required as at year end 2023 at 95%, 99% and 99.5% level of confidence.
- 6.2.5 This report discusses in detail capital requirements at 99.5%, which is equivalent to a 1-in-200 event. Put differently, this is the capital required to sustain the company should extreme events that are expected to occur once every 200 years, occur in 2023. Such events would typically lead to large 'unexpected' losses that could significantly affect the fortunes of the company. The results at 95% (1 in a 20year event) and 99% (1 in a 100year event) are shown in appendix 5 and 6 of the report.
- 6.2.6 We have adopted the following methods in calculating the Economic capital:
- ▶ Value at Risk → this was applied to Market risk and Credit risk
  - ▶ Stochastic approach using Bootstrapping → this was applied to non-Life reserving and premium risks.
  - ▶ Solvency II standard formula approach was adopted for operational risk

Detailed explanation of each of the risks including derivation of the stresses applied are given in appendix 6 of the report.

- 6.2.7 In order to recognize that each individual risk event is unlikely to occur in the same year, aggregation of capital requirements was done. This has the effect of reducing the total required capital - technically called a diversification. The assumed correlation matrix is shown in appendix 7.
- 6.2.8 The calculations were based on same data used to prepare the IFRS valuation as at 31 December 2023 and asset information shown in section 2.3 of this report.

6.2.9 The following results at 99.5% confidence level were obtained.

Risk Type		Capital Requirement (N)
Non-Life Insurance Risk	Reserve Risk	4,868,098,264
	Premium Risk	4,154,770,504
	Catastrophe Risk	351,748,028
	Lapse Risk	-
	SCR <sub>nl</sub> Pre-Div	9,374,616,796
	SCR <sub>nl</sub> Div Credit	2,288,940,257
	SCR <sub>nl</sub> Post Div	7,085,676,539
Market Risk	Interest Rate Risk	1,740,289,810
	Equity Risk	-
	Property Risk	-
	Spread Risk	-
	Currency Risk	-
	Concentration Risk	-
	SCR <sub>mkt</sub> Pre-Div	1,740,289,810
Counterparty Default Risk	SCR <sub>mkt</sub> Div Credit	-
	SCR <sub>mkt</sub> Post Div	1,740,289,810
	Reinsurance credit	178,872,354
	Investment credit & Debtors	306,044,332
	SCR <sub>def</sub> Pre-Div	484,916,686
	SCR <sub>def</sub> Div Credit	-
	SCR <sub>def</sub> Post Div	484,916,686
Undiversified BSCR		9,310,883,035
Diversification Credit		1,342,568,236
Basic SCR		7,968,314,799
Operational Risk		967,434,085
Final Economic capital		8,935,748,884
Shareholders' Funds		52,488,472,000
% of Economic Capital		587%



6.2.10 As shown in the table above, the total Economic Capital required in connection with the business profile at 31st December 2023 was N8.94 billion which is less than the shareholders' funds of N52.49billion.

6.2.11 This implies Zenith has capital excess which provides the management with capital flexibility to conduct its business plan over the forward-looking period taking into account inherent material risks (such as catastrophes) and in anticipation of continued difficult operating conditions in insurance, credit and financial markets.



## 7. Reinsurance Management Strategy

### 7.1 The Company's reinsurance arrangements are summarized in section 7.2.

For each line of business, we illustrate the 'value for money' being the ratio of total reinsurance inflow (i.e., commission income, reinsurance recoveries) to total reinsurance outflow/cost.

#### 2022 Accident Year

₦' 000

Class of Business	Motor	Accident	Bond	Marine	Aviation	Fire	Engineering	Oil & Energy	Total
<b>Outflow</b>									
Cash paid to reinsurers	383,643	229,521	14,798	1,120,631	34,146	1,516,695	1,270,215	1,032,230	5,601,879
<b>Inflow</b>									
Reinsurance Contract Assets Reinsurance	656,003	327,900	3,422	932,301	8,017	907,469	800,268	169,791	3,805,171
<b>Value for Money Ratio</b>	<b>171%</b>	<b>143%</b>	<b>23%</b>	<b>83%</b>	<b>23%</b>	<b>60%</b>	<b>63%</b>	<b>16%</b>	<b>68%</b>

#### 2023 Accident Year

₦' 000

Class of Business	Motor	Accident	Bond	Marine	Aviation	Fire	Engineering	Oil & Energy	Total
<b>Outflow</b>									
Cash paid to reinsurers	480,189	1,167,393	4,676	1,124,773	22,833	2,597,294	645,905	1,588,026	7,631,089
<b>Inflow</b>									
Asset for Remaining coverage	456,154	462,252	900	782,612	2,031	1,459,314	673,151	137,965	3,974,379
<b>Value for Money Ratio</b>	<b>95%</b>	<b>40%</b>	<b>19%</b>	<b>70%</b>	<b>9%</b>	<b>56%</b>	<b>104%</b>	<b>9%</b>	<b>52%</b>

7.1.1 There was a decrease in the value for money ratio from 68% (2022) to 52% (2023) in all the lines of business except for Engineering line of business.

7.1.2 The value for money ratios, however, does not take cognizance of other benefits reinsurance provides e.g. granting the company capacity to underwrite bigger risks than it would ordinarily have been able to take on due to its limited capital resources.

7.1.3 The above suggests that the treaty arrangement are optimal. Details of the current reinsurance arrangement are provided in Appendix 2.

## 7.2 Reinsurance Management

### 7.2.1 Basis and Methods of Retention Levels

The retention limit and the associated product lines were established in liaison with the reinsurers. In setting these limits, the following were taken into consideration:

- The nature and quality of the business
- Regulations imposed by the regulatory body
- Risk appetite of Zenith

While Zenith reinsures seven (7) reinsurers, majority of its businesses are with Continental Reinsurance and African Reinsurance with stable ratings.

Illustrated in the table below is the list of Reinsurers and their ratings:

Reinsurer	Credit Rating
African Reinsurance Corporation, Lagos	A
Continental Reinsurance Plc, Lagos	B+
WAICA Reinsurance Corporation Plc, Sierra Leone	B+
ZEP Re (PTA Reinsurance Company), Nairobi	AAA
FBS Re, Lagos	A-
AVENI-Re Africa	Unrated
Nouvelle Compagnie Africaine de Réassurances' (NCA Re)	BB

## 8. Financial Condition as at 31<sup>st</sup> December 2023

- ▶ We have illustrated above that the company has enough funds to meet its insurance contract liabilities under stressed conditions.
- ▶ The investment portfolio is highly liquid and broadly matches the profile of the company's liabilities.
- ▶ The company has a beneficial reinsurance agreement in place, given the good value for money ratios.
- ▶ We are thus of the opinion that the company would be able to meet policyholder obligations if and when they fall due and is able to withstand stressed scenarios as evidenced by the stress tests.

### 8.1.1 We recommend that the company should:

- ▶ Aim at reducing Management expenses to in effect reduce the combined ratio.

## 9. New Business Plans

### 9.1 Business Plan Production

The table below indicates the year-on-year growth for the various lines of businesses.

Zenith has plans to grow at about 5% and 12% in 2024 and 2025 respectively. We illustrate the forecast in the table below. This seems quite reasonable due to the current economic constraints.

Line of Business	2023	2024		2025	
	₦' 000	₦' 000	YoY Growth	₦' 000	YoY Growth
Motor	5,220,231	5493132	5%	6,152,307	12%
Accident	3,223,062	3391556	5%	3,798,543	12%
Bond	800,763	842625	5%	943,740	12%
Marine	2,247,614	2365114	5%	2,648,928	12%
Aviation	23,026	24230	5%	27,137	12%
Fire	3,554,498	3740318	5%	4,189,157	12%
Engineering	1,020,610	1073965	5%	1,202,840	12%
Oil & Energy	2,916,588	3069060	5%	3,437,348	12%
<b>Total</b>	<b>19,006,392</b>	<b>20,000,000</b>	<b>5%</b>	<b>22,400,000</b>	<b>12%</b>

## 10. Conclusion and Recommendations

- 10.1 Overall, this report demonstrates that the Company remains adequately capitalized with a strong and conservative investment portfolio to support current and projected liabilities while maintaining compliance with regulatory requirements.
- 10.2 As at 31st December 2023, the business had a Net Book Asset Value of N52.49billion or 1750% of the statutory minimum capital of N3billion. Hence the business is well capitalized from the current regulatory point of view.
- 10.3 We estimate the economic/risk-based capital required to support the business at 31st December 2023 as N8.94 billion, a coverage of 587% of the shareholder Funds of N52.49 billion. The company thus holds a cushion above its economic capital which enhances its ability to meet its obligations to policyholders in adverse scenarios.
- 10.4 We note that the company has maintained a well-balanced mix and has not been exposed to concentration risk.
- 10.5 The highest contributor to total premium received remains Motor line of business which contributed approximately 28% to premiums. We recommend that the company continues to monitor the portfolio to avoid any event of concentration risk in the various lines of business.
- 10.6 We are delighted to have conducted this Financial Conditioning Report for Zenith General Insurance Company Limited. We hope you find this helpful for preparing and submitting a report to NAICOM.
- 10.7 We will naturally be delighted to discuss it with you and make necessary presentations.

Yours sincerely,



.....  
**Miller Kingsley, FNAS, FSA**  
**Fellow, Nigerian Actuarial Society**  
**Fellow, Society of Actuaries, USA**  
**FRC/2012/NAS/00000002392**

## APPENDIX 1- RELIANCE & LIMITATIONS

### Reliance

In carrying out this work we have relied upon the financial statements, business plans and other information (including discussions with the Management) provided by Zenith General insurance. The liability information used was the same as that used in the IFRS actuarial valuations. Where stated in this report we have reviewed this data for reasonableness, but we have not verified the accuracy of the information provided to us.

This report takes into account data made available as at 31 December 2023.

In some instances, we were unable to obtain granular information so had to make approximations in certain instances about the composition given knowledge of certain details during the normal end of year valuation process.

### Limitations

Our understanding is that this is a Board report that could be used to demonstrate regulatory compliance with NAICOM, when requested.

This report must be contained in its entirety, as individual sections, if considered in isolation, may be misleading.

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The report may be distributed to the Senior Management of Zenith General Insurance Company Limited for the purpose of discussing its contents.

Actuarial estimates are subject to uncertainty from various sources, including changes in claim reporting patterns, claim settlement patterns, judicial decisions, legislation, and economic conditions. It should therefore be expected that the actual emergence of profits will vary, perhaps materially, from any estimates.

The report is subject to the terms and limitations, including limitation of liability, agreed when commencing this exercise.

## Appendix 2 - Reinsurance Arrangement

CLASS OF BUSINESS	RETENTION/DEDUCTIBLE	TREATY CAPACITY	U/W CAPACITY
<b>MARINE HULL, GENERAL ACCIDENT AND MOTOR TREATIES</b>			
Marine Hull	35,000,000.00	700,000,000.00	735,000,000.00
Fidelity Guarantee (Per Person)	15,000,000.00	225,000,000.00	240,000,000.00
Fidelity Guarantee (Per Firm)	30,000,000.00	450,000,000.00	480,000,000.00
Money in Transit	25,000,000.00	375,000,000.00	400,000,000.00
Money in Safe	20,000,000.00	300,000,000.00	320,000,000.00
Cash in Counting area	15,000,000.00	225,000,000.00	240,000,000.00
Money in Transit	75,000.00	1,125,000.00	1,200,000.00
Money in Safe	75,000.00	1,125,000.00	1,200,000.00
Cash in Counting area	35,000.00	525,000.00	560,000.00
<b>EXCESS OF LOSS TREATIES</b>			
Burglary	Deductible N10,000,000	wi	
	1 <sup>st</sup> Layer: N110,000,000 Xs 10,000,000	470,000,000.00	
	2 <sup>nd</sup> Layer: N350,000,000 Xs 120,000,000		
Goods in Transit	Deductible N10,000,000		
	1st Layer: N110,000,000 Xs 10,000,000	470,000,000.00	
	2nd Layer: N350,000,000 Xs 120,000,000		
All Risks	Deductible N10,000,000		
	1st Layer: N110,000,000 Xs 10,000,000	470,000,000.00	
	2nd Layer: N350,000,000 Xs 120,000,000		
Professional Indemnity	Deductible N10,000,000		
	1st Layer: N110,000,000 Xs 10,000,000	470000000.00	
	2nd Layer: N350,000,000 Xs 120,000,000		
Personal accident/ Group personal accident	Deductible N10,000,000		
	1st Layer: N110,000,000 Xs 10,000,000	470000000	
	2nd Layer: N350,000,000 Xs 120,000,000		
Public Liability	Deductible N10,000,000		
	1st Layer: N110,000,000 Xs 10,000,000	470000000	
	2nd Layer: N350,000,000 Xs 120,000,000		
Directors & Officers Liability	Deductible N10,000,000		
	1st Layer: N110,000,000 Xs 10,000,000	470000000	
	2nd Layer: N350,000,000 Xs 120,000,000		
Product Liability	Deductible N10,000,000		
	1st Layer: N110,000,000 Xs 10,000,000	470000000	
	2nd Layer: N350,000,000 Xs 120,000,000		
Motor (Saloon car, 4 X 4 pick up, jeeps and trucks)	Deductible N10,000,000		
	1st Layer: N10,000,000 Xs 10,000,000	70000000	
	2nd Layer: N50,000,000 Xs 20,000,000		
<b>1st SURPLUS TREATY</b>			
FIRE	Retention N250,000,000	6,500,000,000	
	1st surplus treaty: 6,250,000,000		
	1st Layer: N125,000,000 Xs N125,000,000		
	2nd Layer: N250,000,000 Xs N250,000,000		
	CAT Excess of Loss: N1,500,000,000 Xs 500,000,000		
MARINE CARGO	Retention N150,000,000	3,150,000,000	
	1st surplus treaty: 3,000,000,000		
	CAT Excess of Loss: N700,000,000 Xs 300,000,000		
ENGINEERING	Retention N100,000,000	3,100,000,000	
	1st surplus treaty: 3,000,000,000		
BOND QUOTA SHARE	Retention N60,000,000	120,000,000	
	1st surplus treaty: 60,000,000		
<b>2nd SURPLUS TREATY</b>			
FIRE	Retention N250,000,000	1,500,000,000	
	1st surplus treaty: 1,250,000,000		
MARINE CARGO	Retention N150,000,000	1,050,000,000	
	1st surplus treaty: 900,000,000		
ENGINEERING	Retention N100,000,000	1,100,000,000	
	1st surplus treaty: 1,000,000,000		

## APPENDIX 3 - PROJECTION ASSUMPTIONS

### 1. Commission Rates

#### a.

CURRENT AND EXPECTED COMMISSION RATE			
Class	AGENTS	BROKER	BANCASSURANCE
Motor	6.25%	12.50%	2.00%
Accident	10.00%	20.00%	2.00%
Bond	10.00%	20.00%	2.00%
Marine	10.00%	20.00%	2.00%
Aviation	10.00%	20.00%	2.00%
Fire	10.00%	20.00%	2.00%
Engineering	10.00%	20.00%	2.00%
Oil & Energy	10.00%	20.00%	2.00%

#### b. Reinsurance Commission

Year	Motor	Accident	Bond	Marine	Aviation	Fire	Engineering	Oil & Energy
Commission Income	16%	25%	28%	27%	20%	26%	28%	9%

*\*Derived from the historical weighted average returns*

## APPENDIX 4 - COMBINED RATIO TABLE

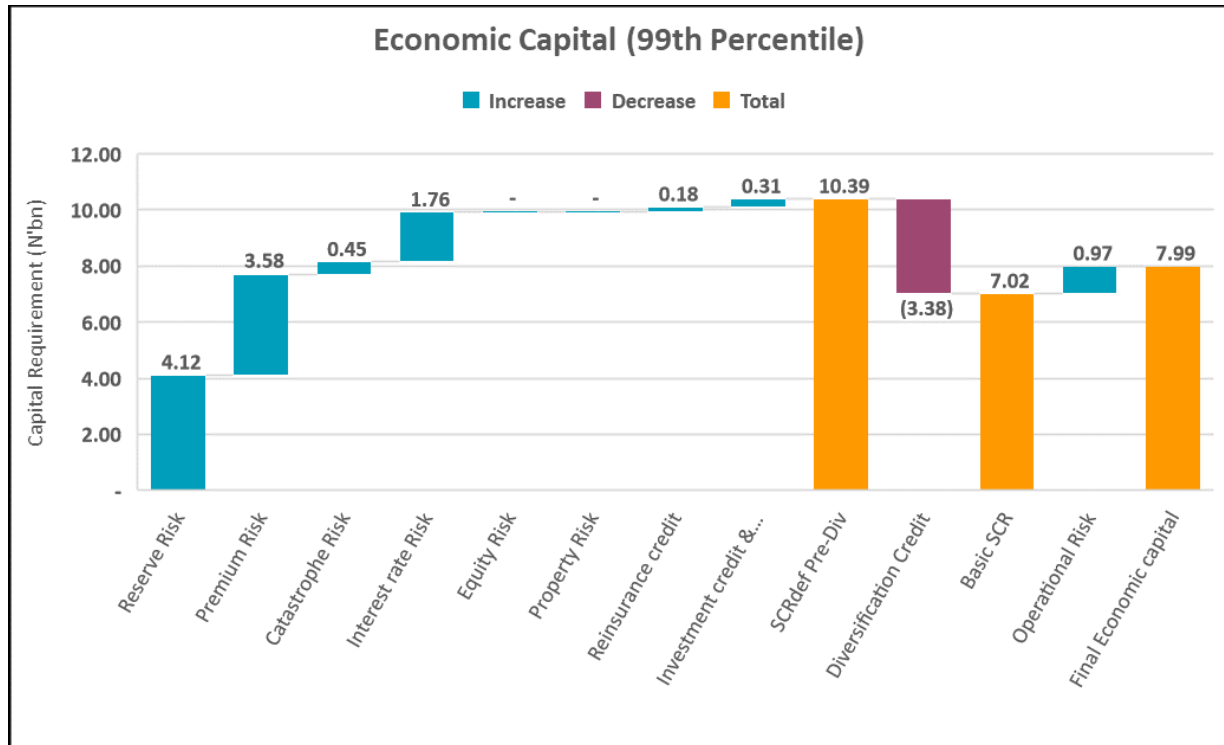


	Year	Motor	Accident	Bond	Marine	Aviation	Fire	Engineering	Oil & Energy	Total
<b>Gross Written Premiums</b>	2017	1,567,230	1,917,763	523,341	1,043,688	40,755	2,008,301	524,881	2,526,496	10,152,455
	2018	1,885,504	2,151,437	427,789	1,130,771	10,855	1,977,581	815,779	2,568,417	10,968,133
	2019	2,419,018	2,567,292	408,227	1,535,930	15,670	2,434,038	1,011,964	2,566,945	12,959,084
	2020	2,685,942	2,500,084	385,278	1,645,838	37,314	2,883,560	1,075,854	2,629,412	13,843,282
	2021	2,662,262	2,447,116	528,793	1,777,068	38,379	2,518,651	903,482	2,238,897	13,114,648
	2022	3,414,996	2,588,791	723,366	1,661,475	37,666	2,929,994	1,274,279	1,910,379	14,540,946
	2023	5,220,231	3,223,062	800,763	2,247,614	23,026	3,554,498	1,020,610	2,916,588	19,006,392
<b>Reinsurance Cost</b>	2017	(255,572)	(762,563)	(20,031)	(472,675)	0	(1,370,949)	(461,261)	(1,372,915)	(4,715,966)
	2018	(495,011)	(655,482)	(21,339)	(501,779)	0	(1,410,092)	(497,356)	(1,169,224)	(4,750,283)
	2019	(519,828)	(1,065,214)	(50,451)	(867,832)	(4,798)	(1,946,838)	(781,664)	(1,392,944)	(6,629,569)
	2020	(426,624)	(718,270)	(14,737)	(929,467)	(28,187)	(1,822,166)	(1,028,849)	(1,404,108)	(6,372,408)
	2021	(461,055)	(740,597)	(8,521)	(1,020,980)	(30,437)	(1,832,021)	(920,828)	(1,448,836)	(6,463,275)
	2022	(347,822)	(387,543)	(12,053)	(926,554)	(78,184)	(1,606,479)	(965,627)	(1,088,270)	(5,412,532)
	2023	(520,187)	(922,254)	(7,782)	(922,761)	(31,052)	(2,302,322)	(833,941)	(1,572,692)	(7,112,991)
<b>Gross Earned Premium</b>	2017	1,602,563	2,194,538	572,609	1,096,633	42,203	1,858,268	510,948	2,567,584	10,445,346
	2018	1,765,993	2,065,876	469,760	1,051,252	10,825	1,907,213	530,501	2,632,554	10,433,974
	2019	2,224,854	2,511,913	421,603	1,523,423	8,244	2,367,153	795,765	2,671,811	12,524,766
	2020	2,688,820	2,562,185	394,828	1,591,814	42,114	2,728,686	1,251,109	2,877,840	14,137,396
	2021	2,649,050	2,366,030	478,386	1,713,788	33,204	2,479,026	966,776	2,296,604	12,982,864
	2022	2,932,185	2,264,212	631,499	1,385,735	32,518	2,789,138	1,102,641	1,878,089	13,016,017
	2023	4,704,238	2,967,024	703,754	1,703,913	33,384	3,438,730	1,260,189	2,623,154	17,434,386
<b>Net Earned Premium</b>	2017	1,346,991	1,431,975	552,578	623,958	42,203	487,320	49,686	1,194,668	5,729,379
	2018	1,270,982	1,410,394	448,421	549,473	10,825	497,121	33,145	1,463,330	5,683,691
	2019	1,705,026	1,446,699	371,152	655,591	3,446	420,315	14,101	1,278,867	5,895,197
	2020	2,237,916	1,792,404	376,756	698,256	9,409	960,386	103,572	1,390,146	7,568,845
	2021	2,187,995	1,625,433	469,865	692,808	2,768	647,006	48,947	847,768	6,519,590
	2022	2,584,363	1,876,669	619,446	459,181	(45,666)	1,182,659	137,014	789,819	7,603,485
	2023	4,184,051	2,044,770	695,972	781,152	2,332	1,136,408	426,248	1,050,462	10,321,395
<b>Incurred Claims (Gross)</b>	2017	760,136	503,937	708,138	376,089	28,812	2,658,258	42,869	1,530,954	6,609,193
	2018	801,352	(704,303)	301,894	675,906	13,665	1,014,009	319,000	3,434,848	5,856,371
	2019	918,151	579,601	(756,803)	554,301	2,616	658,475	214,366	984,925	3,155,632
	2020	1,138,766	484,494	(332,658)	453,815	603	1,614,020	382,669	2,324,214	6,065,923
	2021	1,087,577	301,566	(106,053)	459,842	(1,773)	1,477,352	114,796	(176,445)	3,156,862
	2022	1,412,827	595,210	(12,968)	60,394	509	161,063	(47,754)	311,424	2,480,705
	2023	1,207,481	892,881	0	85,584	(863)	1,186,513	161,991	539,176	4,072,763
<b>Incurred Claims (Net)</b>	2017	584,044	388,294	320,539	239,821	28,812	851,354	(29,561)	931,993	3,315,296
	2018	759,855	(776,989)	258,402	271,430	13,665	370,287	183,888	2,207,043	3,287,581
	2019	645,085	529,690	(385,756)	236,377	2,616	295,164	89,422	880,702	2,293,300
	2020	851,016	497,279	(236,654)	151,448	603	603,819	138,475	2,145,760	4,151,746
	2021	823,254	321,807	(80,564)	407,831	(1,773)	(120,484)	118,070	(39,117)	1,429,024
	2022	1,182,434	474,173	(12,968)	(226,937)	(187,261)	420,934	(47,010)	256,147	1,859,512
	2023	1,045,027	696,122	0	(48,494)	(863)	133,683	(36,755)	549,125	2,337,845
<b>Commission Received</b>	2017	28,805	246,902	6,323	163,235	0	311,192	138,697	42,312	937,465
	2018	60,868	177,452	6,649	157,989	0	408,199	121,156	41,139	973,452
	2019	69,582	249,165	55,114	273,296	2,300	469,309	240,485	47,784	1,407,035
	2020	77,075	193,237	5,651	309,493	7,170	461,865	330,779	81,412	1,466,682
	2021	76,126	189,107	2,780	282,262	7,365	466,298	222,236	132,803	1,378,977
	2022	52,494	85,013	3,232	226,325	7,395	429,469	300,132	73,383	1,177,443
	2023	81,596	248,732	1,972	276,622	7,221	598,000	239,504	169,594	1,623,241
<b>Underwriting expenses</b>	2017	154,593	413,267	38,882	211,688	8,244	335,641	51,926	172,818	1,387,060
	2018	193,989	416,193	33,659	225,253	1,931	398,443	73,467	148,988	1,491,923
	2019	264,633	527,673	27,548	338,230	1,293	535,425	125,257	179,714	1,999,773
	2020	347,077	512,700	18,782	337,302	7,670	555,642	240,086	448,762	2,468,021
	2021	303,522	473,898	25,364	339,209	6,717	438,352	187,703	479,225	2,254,020
	2022	379,599	444,728	35,674	291,994	6,584	499,822	224,362	415,842	2,298,606
	2023	629,858	579,700	57,800	324,019	7,321	588,680	259,851	587,336	3,034,564
<b>Management expenses</b>	2017									(2,666,538)
	2018									(2,781,948)
	2019									(3,488,705)
	2020									(3,550,350)
	2021									(3,382,656)
	2022									(4,399,152)
	2023									(5,043,478)
<b>Claims Ratio (Net)</b>	2017	47%	23%	124%	34%	68%	143%	8%	-60%	58%
	2018	60%	-55%	58%	49%	126%	74%	-555%	151%	58%
	2019	38%	37%	-104%	36%	76%	70%	634%	69%	39%
	2020	38%	28%	-63%	22%	6%	63%	134%	154%	55%
	2021	38%	20%	-17%	59%	-64%	-19%	257%	-5%	22%
	2022	46%	25%	-2%	-49%	410%	36%	-34%	32%	24%
	2023	25%	34%	0%	-6%	-37%	12%	-9%	52%	23%
<b>Expense Ratio</b>	2017	31%	35%	25%	44%	25%	108%	277%	56%	47%
	2018	0%	0%	0%	0%	0%	0%	0%	0%	49%
	2019	0%	0%	0%	0%	0%	0%	0%	0%	59%
	2020	0%	0%	0%	0%	0%	0%	0%	0%	52%
	2021	0%	0%	0%	0%	0%	0%	0%	0%	58%
	2022	0%	0%	0%	0%	0%	0%	0%	0%	49%
	2023	0%	0%	0%	0%	0%	0%	0%	0%	49%
<b>Combined Ratio</b>	2017	74%	62%	83%	82%	43%	283%	218%	134%	104%
	2018	60%	-55%	58%	49%	126%	74%	-555%	151%	107%
	2019	38%	37%	-104%	36%	76%	70%	634%	69%	98%
	2020	38%	28%	-63%	22%	6%	63%	134%	154%	102%
	2021	38%	20%	-17%	59%	-64%	-19%	257%	-5%	74%
	2022	46%	25%	-2%	-49%	410%	36%	-34%	32%	82%
	2023	25%	34%	0%	-6%	-37%	12%	-9%	52%	72%

## APPENDIX 5: ECONOMIC CAPITAL RESULTS AT 99% CONFIDENCE LEVEL

Should the confidence level be lowered our confidence level to 99%, the total economic capital requirement reduces to N7.3 billion which represents about 719% of the shareholder funds as at December 31, 2023

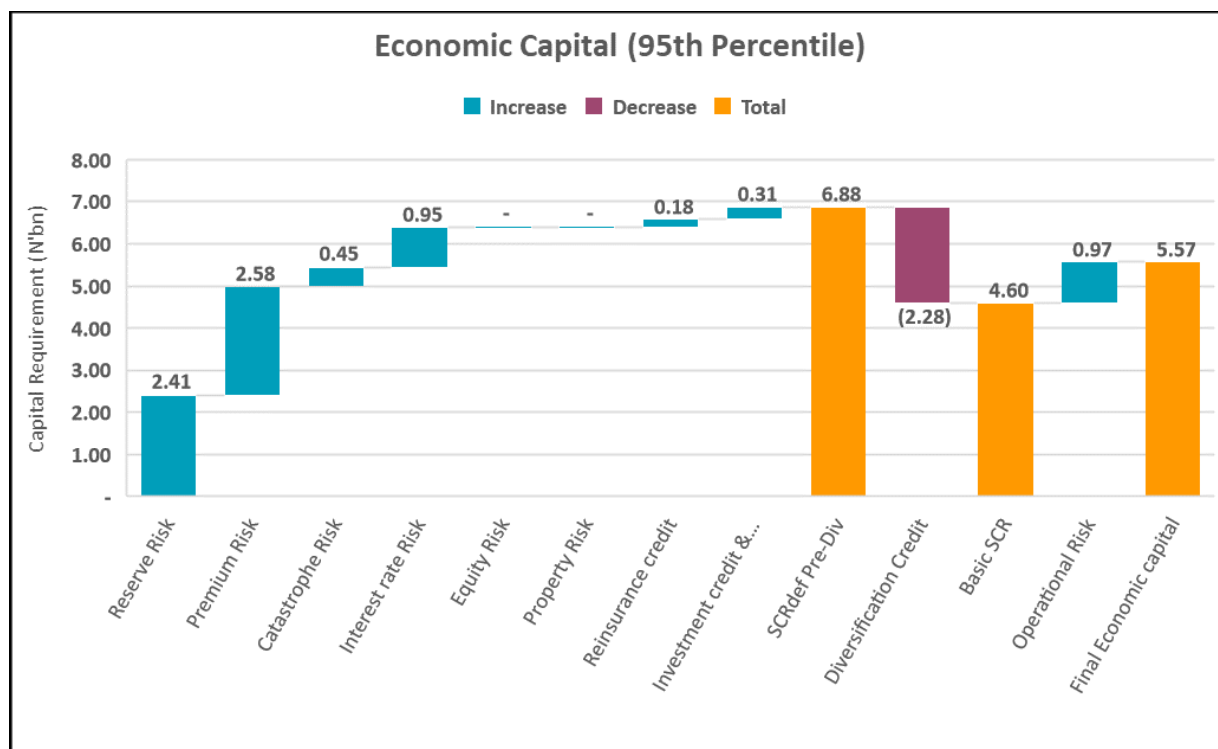
Risk Type		Capital Requirement (N)
Non-Life Insurance Risk	Reserve Risk	4,118,386,511
	Premium Risk	3,582,519,096
	Catastrophe Risk	451,696,037
	Lapse Risk	-
	SCR <sub>nl</sub> Pre-Div	8,152,601,644
	SCR <sub>nl</sub> Div Credit	2,053,321,257
	SCR <sub>nl</sub> Post Div	6,099,280,387
Market Risk	Interest Rate Risk	1,756,542,149
	Equity Risk	-
	Property Risk	-
	Spread Risk	-
	Currency Risk	-
	Concentration Risk	-
	SCR <sub>mkt</sub> Pre-Div	1,756,542,149
Counterparty Default Risk	SCR <sub>mkt</sub> Div Credit	-
	SCR <sub>mkt</sub> Post Div	1,756,542,149
	Reinsurance credit	178,872,354
	Investment credit & Debtors	306,044,332
		484,916,686
	SCR <sub>def</sub> Pre-Div	-
	SCR <sub>def</sub> Div Credit	-
	SCR <sub>def</sub> Post Div	484,916,686
Undiversified BSCR		8,340,739,222
Diversification Credit		1,322,038,600
Basic SCR		7,018,700,622
Operational Risk		967,434,085
Final Economic capital		7,986,134,707
Shareholders' Funds		52,488,472,000
% of Economic Capital		657%



## APPENDIX 6: ECONOMIC CAPITAL RESULTS AT 95% CONFIDENCE LEVEL

Should the confidence level be lowered our confidence level to 95%, the total economic capital requirement reduces to N5.2 billion which represents about 1009% of the shareholder funds as at December 31, 2023.

Risk Type		Capital Requirement (N)
Non-Life Underwriting Risk	Reserve Risk	2,413,752,573
	Premium Risk	2,580,328,663
	Catastrophe Risk	451,696,037
	Lapse Risk	-
	SCR <sub>nl</sub> Pre-Div	5,445,777,273
	SCR <sub>nl</sub> Div Credit	1,452,084,545
	SCR <sub>nl</sub> Post Div	3,993,692,728
Market Risk	Interest Rate Risk	951,982,483
	Equity Risk	-
	Property Risk	-
	Spread Risk	-
	Currency Risk	-
	Concentration Risk	-
	SCR <sub>mkt</sub> Pre-Div	951,982,483
Counterparty Default Risk	SCR <sub>mkt</sub> Div Credit	-
	SCR <sub>mkt</sub> Post Div	951,982,483
	Reinsurance credit	178,872,354
	Investment credit & Debtors	306,044,332
	SCR <sub>def</sub> Pre-Div	484,916,686
	SCR <sub>def</sub> Div Credit	-
	SCR <sub>def</sub> Post Div	484,916,686
Undiversified BSCR		5,430,591,898
Diversification Credit		830,658,904
Basic Economic Capital		4,599,932,994
Operational Risk		967,434,085
Final Economic Capital		5,567,367,079
Shareholders' Funds		52,488,472,000
Economic Capital as a % of SF		943%



## Appendix 7: Economic Capital Methodology & Stress Level Derivation.

We present below, detailed explanation on how each of the risk were modelled including stress levels derivation.

## A. MARKET RISKS

1.1 Market risk is defined as the potential for adverse change in the net assets (Market Value of assets less Market Value of liabilities) due to movements in market factors such as equity prices, interest rates, property prices and foreign exchange.

1.2 The company's insurance funds are mainly invested in money market instrument and hence have a very low exposure to market risks.

1.3 The market risk capital requirement  $C_{Mkt}$  for each risk was calculated using the following formula:

$$C_{Mkt} = (A_{Mkt} - A_0)$$

Where  $C_{Mkt}$  - capital calculation for market risk

$A_{Mkt}$  - stressed assets value

$A_0$  - base market value of assets

1.4 The stresses applied for the market risk module were as follows:

Asset class	Stress level @ 95%	Stress level @ 99%	Stress level @ 99.5%
Equity	24.06%	35.90%	37.38%
Property	15.72%	21.64%	22.38%
Interest rate	29.1%	40.12%	41.5%

1.5 The above stresses were obtained by using a combination of fitting historical data of various market indices (were available) to find the appropriate stress level and benchmarking against the Solvency II widely used stress levels.

1.6 The details of the derivation and computation are contained below for each sub-risk module.

### 1.7 Equity risk

I. This is the sensitivity of assets, liabilities and financial investments to fluctuations in the

level or volatility of the market prices for equities.

- II. The company is invested in both quoted and unquoted equities. Both types of equities were stress tested.
- III. The level of stress was derived by considering the historical distribution of the total return Nigerian Stock Exchange ("NSE") index and fitting a distribution to determine the stress level at the various confidence levels.
- IV. We fitted the NSE historical index values from January 1985 to December 2020. The normal distribution was a good fit for the data. Using the normal distribution, we determined stress levels of 29%, 40% and 41% for confidence levels of 95%, 99% and 99.5% respectively.
- V. We also checked how frequently historical annual returns have fallen or been close to the 29.1%, 40.12% and 41.5% levels. In 2008, the stock index fell by about 46% and in 2011 also fell by about 23%.
- VI. Both the quoted and unquoted equities were assumed to be similarly affected by any declines in stock market. This assumption would need to be revisited in the next assessment.

## 1.8 Interest Rate risk

- I. Interest rate risk is caused by the sensitivity of the value of any assets, liabilities and financial investments to fluctuations in the term structure of interest rates or interest rate volatility, whether valued by mark-to-model or mark-to-market techniques.
- II. Stresses were determined by constructing the term structure of interest rates by referencing the 12-month, 3-year, 5 year, 7 year, 10 year and 20 year yields from the Federal Government Bonds.
- III. The historical returns were fitted to distributions to determine the best fit distribution. The normal distribution was a good fit. The normal distribution was used instead in order to apply some consistency with the other market risk stresses.
- IV. As the local term structure of interest rates show a flat yield curve; a flat stress level was applied to bonds of varying durations.
- V. The stresses used are shown in table 3 above at various confidence levels to all bond yields of varying duration according to the Company bond holdings.
- VI. The stressed yields were applied using the formula: current yield x (1+Upward stress) OR current yield x (1+Downward stress).
- VII. The capital requirement was then determined by adopting the stress level (between the upward and the downward stress) that resulted in a higher capital requirement i.e. Interest Rate capital requirement = Max {0; Upward stress capital; Downward stress capital}

1.9 The overall market risk capital was then derived by combining the equity, property and interest

rate risk capital using the suggested correlation matrix below.

$$C_{Mkt} = \sqrt{\sum CorrMkt_{ij} * C_{Mkt_i} * C_{Mkt_j}}$$

Where  $C_{Mkt}$  - overall market risk capital calculation including equity, property and interest rate

$C_{Mkt_i}$  - capital for i-th risk (i could be any of the three risks)

$C_{Mkt_j}$  - capital for j-th risk (j could be any of the three risks)

1.10 The correlation matrix used is shown in Appendix 7

### 1.11 Non-Life Insurance risks

The non-life insurance risks modelled were:

- ▶ Reserving risk
- ▶ Premium risk
- ▶ Catastrophe risk

#### I. Reserving risk

This is one of the sources of underwriting risk for general insurance.

Reserve risk results from fluctuations in the timing and amount of claim settlements.

The reserve risk methodology was as follows:

- ▶ We used the bootstrap approach to calculate the mean and standard deviation of losses.
- ▶ We then used the mean and standard deviation to derive the parameters of the lognormal distribution which was used to estimate the 95th, 99th and 99.5th percentiles of the reserve distribution.
- ▶ Reserve capital is the difference between each of the following percentiles; 95th-percentile, 99th-percentile or 99.5th-percentile of the distribution and the 50th -percentile (Best estimate).



## II. Premium risk

This is another source of underwriting risk for general insurance.

Premium risk results from fluctuations in the timing, frequency and severity of insured events. It relates to the unexpired risks on existing contracts. Premium risk includes the risk that premium provisions turn out to be insufficient to compensate claims or need to be increased.

The premium risk methodology was as follows:

- ▶ Average loss ratios were derived from the expected loss ratio in the business plan (pricing)
- ▶ Historical loss ratios were investigated and deviations from the mean studied.
- ▶ The lognormal distribution was fit (which was the best fit) to the deviations

## III. Catastrophe risk

This is Catastrophe for the general insurance business.

It covers mainly high severity and low frequency catastrophic events e.g. floods, hurricanes, large accidents impacting on all general insurance lines of business insured by the Company.

There have been no major catastrophic events in Nigeria recently hence the data to use in determining the risk capital was scarce.

The catastrophe risk methodology was therefore as follows:

- ▶ The 2023 loss ratios were increased by 1000% for all lines of business to resemble a catastrophic-like event
- ▶ A 1% probability of occurrence was applied to determine the final capital requirement.

## B. CREDIT RISK

- I. Credit risk arises as a result of the unexpected default, or deterioration in credit standing, of an insurer's counterparties or debtors.
- II. The scope of the calculation under this risk module covered possible defaults by banks; where cash and cash equivalents are held by the Company, defaults by reinsurers compromising reinsurance recoveries and the inability by debtors to pay their dues.
- III. The following exposures to counterparties were used:
  - ▶ Banks → cash and cash equivalent holdings
  - ▶ Reinsurers → estimated reinsurance recoveries over the next 12 months
  - ▶ Debtor → amounts owed.

- IV. The expected losses given default were calculated using the latest credit ratings and associated probabilities of default for the different counterparties. A combination of local agencies and the S&P default rates were used for the bank holdings as per the following table:

*Table 5*

Rating Scale	Default Probability
AAA	0.00%
AA+	0.00%
AA	0.02%
AA-	0.03%
A+	0.05%
A	0.05%
A-	0.06%
BBB+	0.09%
BBB	0.15%
BBB-	0.24%
BB+	0.32%
BB	0.48%
BB-	0.96%
B+	1.98%
B	3.13%
B-	6.52%
Unrated	26.53%

- V. The above default rates were applied to both the banks and reinsurers' counterparties to the Company.
- VI. The formula used was: Estimated exposure x Probability of Default x Loss Given Default.
- VII. We assumed a 100% loss given default, which is a conservative assumption.

## C. OPERATIONAL RISK

- I. This is the risk of loss arising from inadequate or failed internal processes, or from personnel and systems, or from external events.
- II. Operational risk is generally a material risk and one of the major causes of organizational failure.
- III. There are several approaches used to assess Operational risk namely;
  - ▶ Basic indicators or some Standard Formula - this is a simpler approach and largely defined by regulatory bodies. It is transparent and a well-known approach.
  - ▶ Scenario approach - qualitative scenario assessments of the operational risks as defined by management through the risk heat map are transformed into quantitative assessments to determine the overall operational risk capital
  - ▶ Statistical or Loss Distribution Approach - this uses a lot of statistics. The amount of possible losses and frequency of losses are modelled separately and then combined to determine the overall capital requirement. This approach relies on the availability of credible historical and forward-looking data.
  - ▶ The Structural or Causal approach - this is the most complex and recently researched approach. It also relies on understanding the interdependencies across risks in addition to the data availability.
- IV. We adopted the standard formula approach due to limited quantity of data available. The approach took into account the earned premium, technical provisions and Base capital calculated before operational risk.
- V. The formula used to compute the capital requirement was as follows:

$$C_{op} = \text{Min} \{0.3 * BSCR, BOp\} + 0.25 \times Exp_{nl}$$

$Exp_{nl}$  is the amount of annual expenses incurred during the previous 12 months in respect of non-linked business

$BSCR$  is the preliminary capital required before allowing operational risk and, for the risk requirements it is defined as:

$$CR_{Op} = \sum (C_{ins} + C_{Mkt} + C_{Credit})$$

$BOp$  is the basic operational risk requirement for all business and is determined as follows:

$$BOp = \text{Max} \{Op_{premiums}; Op_{provisions}\}$$

Where

$$Op_{premiums} = 0.03 \times Earn_{nl} + \text{Max} \{0, 0.03 \times [Earn_{nl} - 1.1 \times pEarn_{nl}]\}$$

$$\text{and } Op_{provisions} = 0.03 \times \text{Max} \{0, Tp_{nl}\}$$

$Earn_{nl}$  are the gross premiums earned during the previous 12 months.

$pEarn_{nl}$  are the gross premiums earned during the 12 months prior to the previous 12 months.

$TP_{nl}$  are the technical provisions

VI. In the future, we recommend the following be recorded at granular level:

- ▶ Frequency of occurrence of all risk scenarios captured in the Risk Heat Map
- ▶ Identification of new exposures and new likelihood percentages after mitigation efforts have been applied.

This would improve how operational risk is quantified.

## APPENDIX 8 - CORRELATION MATRICES

Correlations for Market risks have been derived using actuarial judgement and referencing correlations being used in other jurisdictions for new solvency regimes.

Local market relevance was taken into account before applying these correlations.

As a rule of thumb, the following thought process was applied:

Correlation coefficient	Interpretation
0%	Independent
25%	Weakly correlated
50%	Moderately correlated
75%	Strongly correlated
100%	Dependent

The correlation matrices used for diversification are shown below.

### Market risk correlations

Parameters						
Corr <sub>ij</sub>	Mkt <sub>int</sub>	Mkt <sub>eq</sub>	Mkt <sub>prop</sub>	Mkt <sub>sp</sub>	Mkt <sub>conc</sub>	Mkt <sub>fx</sub>
Mkt <sub>int</sub>	100%	0%	0%	0%	0%	25%
Mkt <sub>eq</sub>	0%	100%	25%	75%	0%	25%
Mkt <sub>prop</sub>	0%	25%	100%	50%	0%	25%
Mkt <sub>sp</sub>	0%	75%	50%	100%	0%	25%
Mkt <sub>conc</sub>	0%	0%	0%	0%	100%	0%
Mkt <sub>fx</sub>	25%	25%	25%	25%	0%	100%

### Comments:

- ▶ Equity vs Property - the local stock and property markets have seen low correlations.
- ▶ The drop in equity values seem not to affect the property values, hence a weak correlation assumption.
- ▶ Interest rate vs Equity/Property - no correlation was assumed if under the interest rate stress an increase in interest rates triggered a capital requirement (as opposed to a decrease in interest rates). 50% correlation was assumed if the decrease in interest rates would trigger a capital requirement under the interest rate stress.
- ▶ Spread, concentration and foreign exchange risks were not modelled.

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