Anchor Insurance Ltd

Financial Condition Report as at 31st December 2022

Prepared by

LOGIC PROFESSIONAL SERVICES

Rear Wing, 4th Floor Oshopey Plaza, 17/19, Allen Avenue, Ikeja, Lagos.

April 2023

EXECUTIVE SUMMARY

This report discusses the adequacy of the company's resources (capital, reinsurance arrangements) in meeting its contracted obligations, especially if adverse situations arise.

The following are the key conclusions of the report.

- The business is well capitalized to pursue its business strategic objectives.

- We estimate that the economic/risk-based capital required to support the business at 31st December 2022 as N4.52billion. This is about 151% of the minimum statutory requirement of N3billion. The business however has Shareholder Funds of N13.05billion or 289% the needed Risk Based Capital.

- The claims ratio has been low at under 30% since year 2015 to review date indicating good underwriting practice. The expense ratio however increased significantly in the year under review following an improvement in 2021. We advise the company continues to adopt measures that 'curb' these expenses to deliver more profits while maintaining the good underwriting practice.

- The company's business is growing at a rapid rate, we advise a more in-depth business planning exercise be carried out to inform capital allocation as well as closer attention to risk management practices. Accordingly, we advise that the company should

    - develop a quantitative Risk Appetite Statement incorporating its broad objective e.g.
        - Conducting your business in such a way that no more than 20% of your capital is at risk.
        - Probability of Profits being zero or worse <=5% (1 year in 20).
        - Risk Adjusted Returns on capital will always exceed 5% etc.
        - (Credit) Rating – Conduct your affairs to achieve/maintain an international credit rating of B etc.

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STRICTLY PRIVATE AND CONFIDENTIAL

March 13, 2023

The Board of Directors
Anchor Insurance Ltd
Plot 21, Ahmed Onibudo Street
Victoria Island
Lagos.

Attention: Mr. Augustine Osegha Ebose (Managing Director)

Dear Sir,

Financial Condition Report as at 31st December 2022 – Anchor Insurance Ltd

1 Introduction

1.1 We are pleased to present our Financial Condition Report ("FCR") for Anchor Insurance Ltd ('the Company") as at 31st December 2022.

1.2 The aim of the Financial Condition Report is to present a non-technical easy to read document detailing the recent business and operational trends, the current financial status as well as an assessment of the business remaining solvent in the near future basing the future projections on different risk scenarios.

1.3 This report discusses the adequacy of the company's resources (capital, reinsurance arrangements) in meeting its contracted obligations, especially if adverse situations arise.

2 Business Overview

2.1 Premium History

2.1.1 The company's Gross Written Premiums increased consistently over the last three years with about 26% growth achieved between 2021 and 2021. This is illustrated in the table below.

Gross Written Premiums (2019 - 2022)

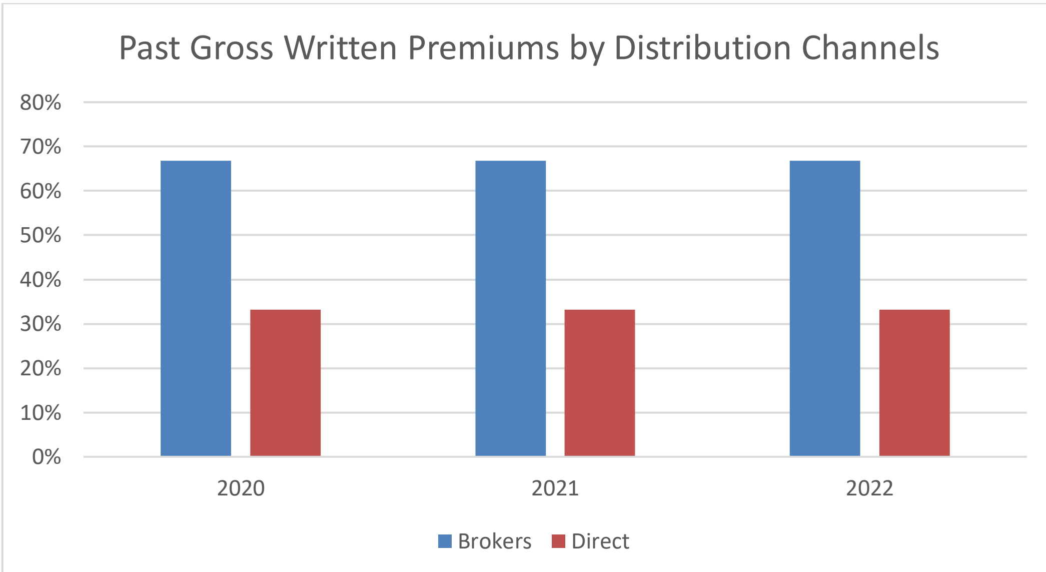
Line of Business	2019		2020		2021		2022	
	N'000	Percentage	N'000	Percentage	N'000	Percentage	N'000	Percentage
Accident	846,596	20.2%	1,433,868	21.7%	1,697,832	16.3%	2,682,293	20.4%
Fire	248,439	5.9%	255,434	3.9%	302,307	2.9%	1,164,502	8.9%
Marine	718,747	17.1%	1,617,374	24.5%	2,353,220	22.5%	2,739,219	20.8%
Motor	943,939	22.5%	1,082,765	16.4%	882,096	8.4%	863,383	6.6%
Oil & Gas	1,070,723	25.5%	1,189,540	18.0%	4,664,354	44.7%	4,949,047	37.6%
Bond	143,493	3.4%	92,260	1.4%	48,995	0.5%	212,358	1.6%
Engineering	220,672	5.3%	936,963	14.2%	496,388	4.8%	534,618	4.1%
Total	**4,192,609**	**100.0%**	**6,608,204**	**100.0%**	**10,445,192**	**100.0%**	**13,145,420**	**100.0%**

2.1.2 We observed the following

- Oil & Gas was the largest contributor with Marine being the second largest contributor of the business written during the year.
- Marine, Oil & Gas, General Accident and Marine all had premium volumes in excess of N2bn.
- Fire and Marine lines are the fastest growing at an average of about 20% in the last 3 years.
- Bond business line of business remain the lowest contribution at less than 2%.

This distribution, in our view, implies there was no undue concentration risk by business type over the review period.

We illustrate below the recent history of business acquisition by distribution channel. It is observed that the company's products were mainly acquired through Brokers. Thus, moving forward, the company will, as part of its business development plans, need to continue to nurture its relationships with brokers without compromising on underwriting standards



2.2 Experience analyses, Asset Mix and Capital Adequacy

2.2.1 We discuss in this section, some metrics that illustrate profitability and investment returns on the portfolio.

Metric	Definition
Claims Ratio	Net Claims Incurred/ Net Earned Premium
Expense Ratio	{Underwriting Expenses + Management Expenses – Commission Income}/ Net Written Premium
Combined Ratio	Claims Ratio + Expense Ratio
Capital Adequacy Ratio	Free Assets/Higher of 15% of Net written premiums or N3bn
Balance Sheet Solvency Ratio	(Shareholders' Funds+ Policyholders Funds)/Technical Reserves
***Regulatory Solvency Ratio**	(Free Assets+ Policyholders Funds)/Technical Reserves

**Free assets includes allowance for admissibility rules*

2.2.2 The table below shows recent experience in terms of Claims, Expense and Combined Ratios.

Year	Claims Ratio	Expense Ratio	Combined Ratio	Investment Income as a % of NWP
2015	27%	65%	92%	10%
2016	16%	75%	91%	12%
2017	27%	81%	108%	12%
2018	29%	69%	98%	9%
2019	27%	23%	50%	6%
2020	26%	47%	72%	2%
2021	22%	34%	56%	1%
2022	11%	67%	78%	4%

**breakdown of combined ratio by line of business is shown in appendix 4 of the report*

2.2.3 The claims ratio has been low at under 30% since year 2015 to review date indicating **good underwriting practice**. The expense ratio increased significantly in the year under review following an improvement in 2021. We advise the company continues to adopt measures that 'curb' these expenses to deliver more profits while maintaining the good underwriting practice.

2.2.4 Profit After Tax has been increasing consistently as shown in the table below. This position has been well supported by good underwriting results and recent consistent improvements in investment income.

Year	Profit After Tax ₦'000	Underwriting Profit * ₦'000	Investment Income ₦'000
2015	204,766	964,504	176,561
2016	227,540	1,013,146	202,955
2017	133,333	993,865	229,406
2018	175,179	1,515,053	244,892
2019	220,184	1,703,680	216,031
2020	436,498	2,160,704	160,770
2021	867,551	2,991,413	114,208
2022	1,223,298	4,015,903	269,894

*Excludes Management Expenses

2.2.5 We illustrate in the table below, that company's return on equity has been low though Shareholders' Fund increased by nearly 100% over the review period. We are of the view that a 'taming' of the expense ratio will help increase returns in the future.

Year	Shareholders' Fund N'000	Return on Equity %
2015	4,522,386	5%
2016	4,749,926	5%
2017	5,071,649	3%
2018	5,162,072	3%
2019	5,495,818	4%
2020	5,669,177	8%
2021	6,449,404	13%
2022	13,045,957	9%

2.3 Asset Mix

We illustrate below the assets mix backing the technical provisions in 2021 and 2022

Assets	Insurance Funds			
	N'000			
	2021	%	2022	%
Cash and Cash Equivalent	624,527	24.67%	580	0.02%
Financial assets	1,269,548	50.15%	2,241,234	68.49%
Reinsurance asset	390,609	15.43%	783,769	23.95%
Investment property	246,800	9.75%	246,801	7.54%
Total	2,531,484	100%	3,272,384	100%

About 68% of the company's asset portfolios in 2022 were in cash and near cash assets which are placements with leading financial institutions and the balance represents Reinsurance assets i.e. payments expected from reinsurers which are leading international companies. Thus, we are of the view that this asset mix is adequate and secure – in particular we expect liabilities will be met as they arise.

2.4 Capital Adequacy

2.4.1 Balance Sheet Solvency

We illustrate in the table below that the company at all times had sufficient buffer to meet emerging liabilities.

Year	2019	2020	2021	2022
Technical Liabilities	987,587	1,445,117	2,289,672	2,543,404
Shareholders Fund (Free Assets)	5,495,818	5,669,177	6,449,404	13,045,957
Balance Sheet Solvency Ratio	656%	492%	382%	613%

These solvency ratios are high and give comfort that ordinarily, we expect liabilities to be met as at when due. We highlight regulatory solvency below and discuss risk-based solvency in section 6.

2.4.2 Regulatory Solvency

We illustrate below that the company met its regulatory solvency requirements throughout the three (3) year review period and had high (i.e. 398%) capital adequacy in 2022.

Year	2019	2020	2021	2022
Technical Liabilities	987,587	1,445,117	2,289,672	2,543,404
Free Assets (allowing for admissible rules)	5,495,817	6,837,662	8,771,587	11,944,779
Maximum of 15% Net premium and N3billion	3,000,000	3,000,000	3,000,000	3,000,000
Capital Adequacy	183%	228%	292%	398%
Regulatory Solvency Ratio	656%	573%	483%	570%

2.6 Reinsurance

We illustrate in the table below that the reinsurance arrangements led to overall net outflow in all the years under consideration. We advise that the company monitors its reinsurance treaty programme more closely.

2021 Accident Year
₦' 000

Class of Business	Accident	Fire	Marine	Motor	Oil & Gas	Bond	Engineering	Total
Outflow								
Reinsurance Cost	305,770	777,369	1,930,204	11,597	2,519,382	24,949	130,021	5,699,292
Inflow								
Reinsurance Commission	24,238	175,701	94,136	1,806	272,905	4,253	1,037	574,076
Reinsurance Recoveries (Incl IBNR)	21,848	87,760	28,883	73,794	-	(1,521)	13,536	224,300
Total Inflow	**46,086**	**263,461**	**123,019**	**75,600**	**272,905**	**2,732**	**14,573**	798,376
Total RI Profit/(Loss)	(259,684)	(513,908)	(1,807,185)	64,003	(2,246,477)	(22,217)	(115,448)	(4,900,916)

2022 Accident Year
₦' 000

Class of Business	Accident	Fire	Marine	Motor	Oil & Gas	Bond	Engineering	Total
Outflow								
Reinsurance Cost	305,770	777,369	1,930,204	11,597	2,519,382	24,949	130,021	5,699,292
Inflow								
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Total RI Profit/(Loss)	(259,684)	(513,908)	(1,807,185)	64,003	(2,246,477)	(22,217)	(115,448)	(4,900,916)

2.7 <u>Stress Scenario for 2022 Results</u>

2.7.1 We applied a 20% stress on the current ultimate loss ratio for each line of business to derive the stressed estimate of outstanding claim reserves. This resulted in a total additional outstanding claim reserve of about N344 million.

2.7.2 We illustrate the revised solvency margin for 2022 in the table below

Year	2022 – Stressed	2022
Technical Liabilities	2,797,744	2,543,404
Shareholders Fund (Free Assets)	12,791,617	13,045,957
Balance Sheet Solvency Ratio	557%	613%

2.7.3 The above table demonstrate that the solvency margin would not be materially impacted should claim ratio increase by 20%.

3 Financial condition as at 31st December 2022

3.1 Based on our discussions above we are of the view that;

- **The business is in a sound financial condition.** We have demonstrated that the solvency ratio exceeded 550% of technical liabilities on both the regulatory admissibility basis and IFRS balance sheet basis.

  We have further demonstrated that on a **stressed** basis, the balance sheet solvency ratio at the review date exceeds 500% of the liabilities.

3.2 We advise that the company should

- develop a quantitative Risk Appetite Statement incorporating its broad objective e.g.

  - Conducting your business in such a way that no more than 20% of your capital is at risk.
  - Probability of Profits being zero or worse <=5% (1 year in 20).
  - Risk Adjusted Returns on capital will always exceed 5% etc.
  - (Credit) Rating – Conduct your affairs to achieve/maintain an international credit rating of B etc.

- Further trim its expense ratio with a view to deliver more profits

4 New Business Plans

4.1 Business Plan Production

4.1.1 As indicated in section 2.1.1, the company experienced an average premium growth rate of about 41% p.a. over the 2020 - 2022 period. The company plans to grow at 25% over the projection period. We illustrate this forecast business production:

Line of Business	**2022**		**2024**		**2025**	
	N'000	%	N'000	%	N'000	%
Accident	2,933,225	16%	3,666,531	16%	4,583,164	16%
Engineering	1,168,358	6%	1,460,448	6%	1,825,559	6%
Fire	4,747,699	25%	5,934,624	25%	7,418,281	25%
Marine	1,130,438	6%	1,413,047	6%	1,766,309	6%
Motor	1,026,298	5%	1,282,872	5%	1,603,591	5%
Bond	225,992	1%	282,490	1%	353,112	1%
Oil & Gas	5,137,838	27%	6,422,298	27%	8,027,872	27%
Aviation	2,210,338	12%	2,762,922	12%	3,453,653	12%
Agriculture	169,814	1%	212,267	1%	265,334	1%
Total	**18,749,999**	**100%**	**23,437,500**	**100%**	**29,296,875**	**100%**

4.1.2 We note that the planned business expansion could lead to an increase in management expenses between 2023 and 2025. However, because of the current high level of expenses and our firm recommendation that this can be moderated, we have only increased expense levels at 20% p.a in this projection exercise.

5 Solvency Projections

5.1 The projection process

We have projected the income statements for each of the years 2023 and 2025 assuming claim and expense patterns to date, continue, and adopting the premiums projected for each of the years.

The exercise leads to projected technical liabilities at the end of each year and a corresponding balance sheet. We have assumed that new money accruing into the fund will be invested in money market instruments.

We report our projected solvency ratios herein, we have also stressed these ratios in anticipation of adverse events and comment accordingly.

5.2 Data and Assumptions

5.2.1 The most recent portfolio status and the corresponding valuation dataset forms the base of the projection.

5.2.2 Projections of technical reserves i.e. outstanding claims and unexpired premium reserves are based on the projected sales volume and the historical information at our disposal. The target sales volume information is as detailed in Section 4.1.1 and was provided by the Company.

5.2.3 The unexpired premium reserves were projected for each line of business assuming risk would occur uniformly throughout the year and future portfolio would resemble the past written premiums.

5.2.4 The outstanding claims reserves were projected using the projected earned premiums and the projected claims settlement patterns as determined in the most recent valuation exercise.

5.3 Projections results

5.3.1 The following results were obtained:

INCOME STATEMENT	2023	2024	2025
Gross Written Premium	18,749,999	23,437,500	29,296,875
Gross Premium Income	18,392,181	21,934,159	28,579,473
Reinsurance Cost	(7,058,495)	(8,417,825)	(10,968,144)
Net Premium Income	**11,333,685**	**13,516,334**	**17,611,329**
Commission income	1,045,758	1,522,150	2,147,207
Net Underwriting income	**12,379,443**	**15,038,483**	**19,758,536**
Gross claims incurred	4,152,263	5,205,114	6,832,657
Claims recoveries	(4,874)	(529,725)	(734,959)
Net claims incurred	**4,147,389**	**4,675,389**	**6,097,698**
Underwriting expenses	(4,039,435)	(4,644,776)	(5,878,550)
Total Underwriting Expenses	**8,186,825**	**9,320,165**	**11,976,249**
Underwriting Result	**4,192,618**	**5,718,319**	**7,782,288**
Investment income	376,814	449,381	585,528
Other Operating Income	181,091	215,966	281,397
Management Expenses	(3,020,568)	(3,602,271)	(4,693,639)
Profit before income tax	1,729,955	2,781,395	3,955,574
Income tax expenses	(120,865)	(194,325)	(276,361)
Profit for the year	**1,609,090**	**2,587,069**	**3,679,213**

The revenue accounts showing the breakdown of underwriting results by line of business for each year is shown in appendix 3.

ASSETS & LIABILITIES	2023	2024	2025
TOTAL ASSETS	23,145,300	29,644,290	36,325,741
Liabilities			
Borrowings	245,518	245,518	245,518
Technical Reserves	4,416,643	7,625,438	9,748,770
Trade payables and accruals	48,783	48,783	48,783
Other payables	2,671,751	2,671,751	2,671,751
Total Liabilities	**7,382,695**	**10,591,490**	**12,714,822**
Share capital	7,712,880	7,712,880	7,712,880
Share Premium	355,200	355,200	355,200
Contingency reserves	3,043,722	3,746,847	4,625,753
Other reserves	377,751	377,751	377,751
Retained earnings/accumulated losses	4,273,053	6,860,122	10,539,335
Shareholder's equity	**15,762,606**	**19,052,800**	**23,610,919**
Total liabilities and shareholder's equity	**23,145,300**	**29,644,290**	**36,325,741**

The projected solvency margins are as shown below.

Year	2023	2024	2025
Technical Liabilities	4,416,643	7,625,438	9,748,770
Shareholders Fund (Free Assets)	15,762,606	19,052,800	23,610,919
Balance Sheet Solvency Ratio	**357%**	**250%**	**242%**

5.3.2 The section above illustrates that if business expands at a faster rate than expenses, profits (underwriting and pre-tax) will increase with the possibility of enhancing the payments of dividends to shareholders. The projected solvency ratios are significantly lower due to growth in liabilities not reflected in Shareholders' Funds. We however note that the projected levels are very adequate and that liabilities will be met as and we due.

5.3.3 We performed projections assuming an absolute 20% increase in loss ratio and the following results were obtained.

INCOME STATEMENT	2023	2024	2025
Gross Written Premium	18,749,999	23,437,500	29,296,875
Gross Premium Income	18,392,181	21,934,159	28,579,473
Reinsurance Cost	(7,058,495)	(8,417,825)	(10,968,144)
Net Premium Income	**11,333,685**	**13,516,334**	**17,611,329**
Commission income	1,045,758	1,522,150	2,147,207
Net Underwriting income	**12,379,443**	**15,038,483**	**19,758,536**
Gross claims incurred	4,982,716	6,246,137	8,199,189
Claims recoveries	(5,848)	(635,670)	(881,951)
Net claims incurred	**4,976,867**	**5,610,467**	**7,317,238**
Underwriting expenses	(4,039,435)	(4,644,776)	(5,878,550)
Total Underwriting Expenses	**9,016,302**	**10,255,242**	**13,195,788**
Underwriting Result	**3,363,141**	**4,783,241**	**6,562,748**
Investment income	376,814	449,381	585,528
Other Operating Income	181,091	215,966	281,397
Management Expenses	(3,020,568)	(3,602,271)	(4,693,639)
Profit before income tax	900,477	1,846,317	2,736,034
Income tax expenses	(62,913)	(128,995)	(191,156)
Profit for the year	**837,564**	**1,717,322**	**2,544,878**

ASSETS & LIABILITIES	2023	2024	2025
TOTAL ASSETS	22,373,775	28,003,017	33,550,133
Liabilities			
Borrowings	245,518	245,518	245,518
Technical Reserves	4,416,643	7,625,438	9,748,770
Trade payables and accruals	48,783	48,783	48,783
Other payables	2,671,751	2,671,751	2,671,751
Total Liabilities	**7,382,695**	**10,591,490**	**12,714,822**
Share capital	7,712,880	7,712,880	7,712,880
Share Premium	355,200	355,200	355,200
Contingency reserves	3,043,722	3,746,847	4,625,753
Other reserves	377,751	377,751	377,751
Retained earnings/accumulated losses	3,501,527	5,218,849	7,763,727
Shareholder's equity	**14,991,080**	**17,411,527**	**20,835,311**
Total liabilities and shareholder's equity	**22,373,775**	**28,003,017**	**33,550,133**

Year	**2024**	**2025**	**2026**
Technical Liabilities	4,416,643	7,625,438	9,748,770
Shareholders Fund (Free Assets)	14,991,080	17,411,527	20,835,311
Balance Sheet Solvency Ratio	**339%**	**228%**	**214%**

6 Economic Capital

6.1 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 estimate may fluctuate adversely as a result of unexpected realities.

6.2 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 on the corresponding risk capital, called ECONOMIC CAPITAL.

6.3 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.

6.4 We have calculated for each of the risks, the amount of capital required as at year end 2019 at 95% and 99.5% level of confidence.

6.5 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 2022. 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) are shown in appendix 5 of the report.

6.6 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.

6.7 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.

6.8 The calculations were based on same data used to prepare the IFRS valuation as at 31 December 2022 and asset information shown in section 2.3 of this report.

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

	Risk Type	2022
Non-Life Underwriting Risk	Reserve Risk	4,826,184,848
	Premium Risk	402,580,567
	Catastrophe Risk	225,976,281
	Lapse Risk	-
	SCRnl Pre-Div	5,454,741,696
	SCRnl Div Credit	1,224,653,426
	SCRnl Post Div	**4,230,088,270**
Market Risk	Interest Rate Risk	-
	Equity Risk	-
	Property Risk	-
	Spread Risk	-
	Currency Risk	-
	Concentration Risk	-
	SCRmkt Pre-Div	-
	SCRmkt Div Credit	-
	SCRmkt Post Div	**-**
Counterparty Default Risk	Reinsurance credit	14,946,097
	Investment credit & Debtors	182,994,719
	SCRdef Pre-Div	197,940,816
	SCRdef Div Credit	-
	SCRdef Post Div	**197,940,816**
Undiversified BSCR		4,345,974,585
Diversification Credit		95,512,266
Basic SCR		**4,250,462,319**
Operational Risk		**268,261,484**
Solvency Capital Requirement		**4,518,576,105**
Shareholders' Funds		13,045,957,000
as a % of Shareholders' Fund		34.6%

6.10 As shown in the table above, the total **Economic Capital** required in connection with the business profile at 31st December 2022 was ₦4.52billion. This represents 35% of the total shareholder funds and implies that the company was well capitalized at the review date to meet liabilities (in respect of business on the books) as and at when they arise.

7 Conclusion and Recommendations

7.1 The business is well capitalized to pursue its business strategic objectives.

7.2 We estimate that the economic/risk-based capital required to support the business at 31st December 2022 as N4.52billion. This is about 151% of the minimum statutory requirement of N3billion. The business however has Shareholder Funds of N13.05billion or 289% the needed Risk Based Capital.

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    - (Credit) Rating – Conduct your affairs to achieve/maintain an international credit rating of B etc.

Yours sincerely,

……………………………………..
Jonathan Ben Phiri
Fellow, Institute of Actuaries, UK
(FRC/2016/NAS/00000015016)

APPENDIX 1 – RELIANCE & LIMITATION

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 Anchor Insurance Ltd. 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.

This report takes into account data made available as at 31 December 2022.

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.

Except with the consent of Logic Professional Services, the report and any written or oral information or advice provided by Logic Professional Services must not be reproduced, distributed or communicated in whole or in part to any other person or relied upon by any other person. The report may be distributed to a third party where there is a legal requirement to do so.

The report may be distributed to the Senior Management of Anchor Insurance Ltd 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.

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

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

APPENDIX 3A – REVENUE ACCOUNTS - BASE SCENARIO

2020 PROJECTIONS ASSUMING FULL BUSINESS PLAN									
	2020								2019
REVENUE & EXPENSES	**Accident**	**Fire**	**Marine**	**Motor**	**Oil & Gas**	**Bond**	**Engineering**	**Total**	
INCOME									
Gross Written Premium	1,615,402	474,053	1,371,456	1,801,149	2,043,069	273,802	421,069	8,000,000	4,192,609
Gross Earned Premium	1,491,897	457,516	1,310,094	1,656,271	1,897,876	266,196	407,009	7,486,860	4,112,599
Reinsurance Cost	(145,553)	(180,263)	(360,934)	(28,234)	(617,385)	(60,654)	(129,267)	(1,522,290)	(676,318)
Net Premium Income	1,346,344	277,253	949,160	1,628,037	1,280,491	205,543	277,742	5,964,569	3,436,280
Commission income	47,863	60,573	100,070	2,125	4,093	16,692	43,851	275,268	100,201
Net Underwriting income	**1,394,207**	**337,825**	**1,049,230**	**1,630,162**	**1,284,584**	**222,235**	**321,593**	**6,239,837**	**3,536,481**
EXPENSES									
Gross claims incurred	457,244	420,035	308,607	414,068	413,715	91,495	115,683	2,220,849	928,470
Claims recoveries	(72,681)	(65,316)	(11,934)	(51,316)	(2,365)	(13,885)	(8,519)	(226,016)	1,090
Net claims incurred	**384,563**	**354,720**	**296,673**	**362,752**	**411,350**	**77,611**	**107,164**	**1,994,833**	**929,560**
Underwriting expenses									
Commision paid	215,201	63,152	182,703	149,966	272,174	36,476	56,094	975,767	614,200
Maintenance expense	153,030	45,183	-	158,179	186,773	24,067	42,417	609,650	289,041
Total Underwriting Expenses	368,231	108,335	182,703	308,145	458,948	60,543	98,511	1,585,417	903,241
Total Expenses	**752,794**	**463,055**	**479,376**	**670,897**	**870,297**	**138,153**	**205,676**	**3,580,249**	**1,832,801**
Underwriting profit	**641,413**	**(125,230)**	**569,853**	**959,265**	**414,287**	**84,082**	**115,918**	**2,659,587**	**1,703,680**

2021 PROJECTIONS ASSUMING FULL BUSINESS PLAN									
	2021								2020
REVENUE & EXPENSES	**Accident**	**Fire**	**Marine**	**Motor**	**Oil & Gas**	**Bond**	**Engineering**	**Total**	
INCOME									
Gross Written Premium	2,400,000	600,000	1,700,000	2,500,000	2,000,000	300,000	500,000	10,000,000	8,000,000
Gross Earned Premium	2,300,033	583,983	1,666,590	2,411,141	2,004,433	296,642	492,305	9,755,127	7,486,860
Reinsurance Cost	(217,468)	(225,452)	(442,683)	(42,288)	(629,184)	(67,106)	(154,299)	(1,778,481)	(1,522,290)
Net Premium Income	2,082,565	358,531	1,223,907	2,368,853	1,375,249	229,535	338,005	7,976,646	5,964,569
Commission income	71,511	75,757	122,735	3,182	4,172	18,468	52,343	348,169	275,268
Net Underwriting income	**2,154,076**	**434,288**	**1,346,642**	**2,372,035**	**1,379,421**	**248,004**	**390,349**	**8,324,815**	**6,239,837**
EXPENSES									
Gross claims incurred	704,926	536,142	392,584	602,785	436,943	101,960	139,927	2,915,267	2,220,849
Claims recoveries	(112,051)	(83,370)	(15,182)	(74,704)	(2,498)	(15,473)	(10,304)	(313,582)	(226,016)
Net claims incurred	**592,874**	**452,772**	**377,403**	**528,081**	**434,445**	**86,487**	**129,623**	**2,601,685**	**1,994,833**
Underwriting expenses									
Commision paid	319,724	79,931	226,471	208,154	266,437	39,965	66,609	1,207,291	975,767
Maintenance expense	235,924	57,672	-	230,272	197,260	26,820	51,307	799,254	609,650
Total Underwriting Expenses	555,648	137,603	226,471	438,425	463,696	66,785	117,916	2,006,545	1,585,417
Total Expenses	**1,148,522**	**590,375**	**603,874**	**966,506**	**898,142**	**153,272**	**247,538**	**4,608,230**	**3,580,249**
Underwriting profit	**1,005,554**	**(156,087)**	**742,768**	**1,405,529**	**481,279**	**94,731**	**142,810**	**3,716,585**	**2,659,587**

APPENDIX 3B – REVENUE ACCOUNTS - 20% INCREASE IN LOSS RATIO

2020 PROJECTIONS ASSUMING FULL BUSINESS PLAN									
	2020								2019
REVENUE & EXPENSES	**Accident**	**Fire**	**Marine**	**Motor**	**Oil & Gas**	**Bond**	**Engineering**	**Total**	
INCOME									
Gross Written Premium	1,615,402	474,053	1,371,456	1,801,149	2,043,069	273,802	421,069	8,000,000	4,192,609
Gross Earned Premium	1,491,897	457,516	1,310,094	1,656,271	1,897,876	266,196	407,009	7,486,860	4,112,599
Reinsurance Cost	(145,553)	(180,263)	(360,934)	(28,234)	(617,385)	(60,654)	(129,267)	(1,522,290)	(676,318)
Net Premium Income	1,346,344	277,253	949,160	1,628,037	1,280,491	205,543	277,742	5,964,569	3,436,280
Commission income	47,863	60,573	100,070	2,125	4,093	16,692	43,851	275,268	100,201
Net Underwriting income	**1,394,207**	**337,825**	**1,049,230**	**1,630,162**	**1,284,584**	**222,235**	**321,593**	**6,239,837**	**3,536,481**
EXPENSES									
Gross claims incurred	548,693	504,042	370,329	496,881	496,458	109,794	138,820	2,665,018	928,470
Claims recoveries	(87,217)	(78,379)	(14,321)	(61,579)	(2,838)	(16,662)	(10,223)	(271,219)	1,090
Net claims incurred	**461,476**	**425,664**	**356,008**	**435,302**	**493,620**	**93,133**	**128,597**	**2,393,799**	**929,560**
Underwriting expenses									
Commision paid	215,201	63,152	182,703	149,966	272,174	36,476	56,094	975,767	614,200
Maintenance expense	153,030	45,183	-	158,179	186,773	24,067	42,417	609,650	289,041
Total Underwriting Expenses	368,231	108,335	182,703	308,145	458,948	60,543	98,511	1,585,417	903,241
Total Expenses	**829,707**	**533,999**	**538,711**	**743,448**	**952,567**	**153,675**	**227,109**	**3,979,216**	**1,832,801**
Underwriting profit	**564,500**	**(196,174)**	**510,519**	**886,714**	**332,017**	**68,560**	**94,485**	**2,260,621**	**1,703,680**

2021 PROJECTIONS ASSUMING FULL BUSINESS PLAN									
	2021								2020
REVENUE & EXPENSES	**Accident**	**Fire**	**Marine**	**Motor**	**Oil & Gas**	**Bond**	**Engineering**	**Total**	
INCOME									
Gross Written Premium	2,400,000	600,000	1,700,000	2,500,000	2,000,000	300,000	500,000	10,000,000	8,000,000
Gross Earned Premium	2,300,033	583,983	1,666,590	2,411,141	2,004,433	296,642	492,305	9,755,127	7,486,860
Reinsurance Cost	(217,468)	(225,452)	(442,683)	(42,288)	(629,184)	(67,106)	(154,299)	(1,778,481)	(1,522,290)
Net Premium Income	2,082,565	358,531	1,223,907	2,368,853	1,375,249	229,535	338,005	7,976,646	5,964,569
Commission income	71,511	75,757	122,735	3,182	4,172	18,468	52,343	348,169	275,268
Net Underwriting income	**2,154,076**	**434,288**	**1,346,642**	**2,372,035**	**1,379,421**	**248,004**	**390,349**	**8,324,815**	**6,239,837**
EXPENSES									
Gross claims incurred	845,911	643,370	471,101	723,342	524,332	122,352	167,912	3,498,320	2,665,018
Claims recoveries	(134,462)	(100,044)	(18,218)	(89,645)	(2,998)	(18,567)	(12,365)	(376,299)	(271,219)
Net claims incurred	**711,449**	**543,326**	**452,883**	**633,697**	**521,334**	**103,784**	**155,547**	**3,122,022**	**2,393,799**
Underwriting expenses									
Commision paid	319,724	79,931	226,471	208,154	266,437	39,965	66,609	1,207,291	975,767
Maintenance expense	235,924	57,672	-	230,272	197,260	26,820	51,307	799,254	609,650
Total Underwriting Expenses	555,648	137,603	226,471	438,425	463,696	66,785	117,916	2,006,545	1,585,417
Total Expenses	**1,267,097**	**680,929**	**679,354**	**1,072,122**	**985,031**	**170,570**	**273,463**	**5,128,567**	**3,979,216**
Underwriting profit	**886,979**	**(246,641)**	**667,288**	**1,299,913**	**394,390**	**77,434**	**116,886**	**3,196,248**	**2,260,621**

APPENDIX 4 – Combined Ratio Table

	Year	Accident	Fire	Marine	Motor	Oil & Gas	Bond	Engineering	Total
Gross Written Premiums	2015	229,763	122,044	98,205	831,839	671,296	332,586	56,305	2,342,038
	2016	253,739	77,376	97,720	880,036	492,089	197,803	50,323	2,049,086
	2017	399,571	109,592	118,852	794,966	621,185	99,262	78,411	2,221,839
	2018	480,305	117,849	463,523	1,172,934	1,002,252	110,189	83,117	3,430,168
	2019	846,593	248,439	718,747	943,939	1,070,723	143,493	220,672	4,192,606
Reinsurance Cost	2015	(40,249)	(48,793)	(28,721)	(20,029)	(234,942)	(68,594)	(21,333)	(462,661)
	2016	(26,224)	(31,204)	(25,438)	(4,121)	(161,262)	(39,327)	(15,515)	(303,091)
	2017	(28,667)	(17,648)	(31,320)	(22,241)	(186,691)	(27,104)	(12,484)	(326,155)
	2018								
	2019								
Gross Earned Premium	2015	228,703	122,063	99,087	829,775	636,581	330,444	58,019	2,304,672
	2016	236,402	76,881	96,947	823,522	485,985	197,789	43,256	1,960,782
	2017	395,632	109,640	115,986	842,885	629,772	118,786	82,312	2,295,013
	2018	465,075	115,675	423,997	1,146,325	995,032	105,782	83,685	3,335,572
	2019	821,462	218,370	692,651	969,880	1,078,062	130,828	201,346	4,112,599
Net Earned Premium	2015	188,454	73,270	70,366	809,746	401,639	261,850	36,686	1,842,011
	2016	210,178	45,677	71,509	819,401	324,724	158,461	27,741	1,657,691
	2017	366,964	91,992	84,666	820,644	443,081	91,682	69,828	1,968,857
	2018	390,094	62,128	349,393	1,111,222	744,839	79,405	50,782	2,787,863
	2019	730,657	155,572	581,275	958,505	751,650	101,234	157,387	3,436,280
Incurred Claims (Gross)	2015	(47,055)	(188,499)	(1,597)	(126,534)	(26,962)	(140,162)	(15,625)	(546,434)
	2016	(112,536)	(31,349)	(44,469)	(77,971)	30,238	(55,890)	(3,414)	(295,391)
	2017	(44,323)	(36,842)	(24,601)	(61,234)	(137,283)	(146,999)	(37,792)	(489,074)
	2018	(194,204)	(38,207)	(46,136)	(125,317)	(316,671)	(92,169)	(39,792)	(852,496)
	2019	(265,716)	(32,409)	(49,407)	(227,022)	(250,969)	(2,787)	(105,735)	(934,045)
Incurred Claims (Net)	2015	(39,282)	(177,419)	849	(115,964)	(26,678)	(130,664)	(15,588)	(504,746)
	2016	(105,324)	(25,323)	(42,765)	(72,098)	30,611	(50,226)	(3,068)	(268,193)
	2017	(51,092)	(41,218)	(23,641)	(74,273)	(137,283)	(176,717)	(36,056)	(540,280)
	2018	(195,333)	(35,530)	(30,295)	(113,716)	(316,671)	(99,138)	(23,024)	(813,707)
	2019	(236,871)	(36,507)	(52,347)	(241,601)	(250,969)	9,562	(120,827)	(929,560)
Commission Received	2015	12,563	16,433	6,209	1,412	1,750	18,260	7,651	64,278
	2016	9,611	9,871	6,773	396	1,552	11,996	4,609	44,808
	2017	8,826	6,264	9,028	1,316	526	6,895	4,519	37,374
	2018	21,282	15,450	21,216	1,748	1,119	7,070	11,991	79,875
	2019	24,153	18,357	33,144	1,239	1,663	8,213	13,429	100,201
Underwriting expenses	2015	(40,408)	(70,098)	(26,549)	(111,500)	(56,490)	(109,745)	(22,249)	(437,039)
	2016	(51,406)	(58,598)	(25,716)	(132,603)	(56,999)	(79,386)	(16,450)	(421,158)
	2017	(98,825)	(31,106)	(37,111)	(148,628)	(90,821)	(38,522)	(27,073)	(472,086)
	2018	(75,271)	(73,747)	(119,761)	(147,362)	(91,549)	(28,681)	(24,408)	(560,779)
	2019	(399,621)	(145,782)	(259,936)	(400,927)	(418,637)	(28,219)	(179,680)	(1,832,801)
Management expenses	2015								(843,877)
	2016								(924,608)
	2017								(1,100,898)
	2018								(1,508,396)
	2019								(1,787,363)
Claims Ratio (Net)	2015	21%	242%	1%	14%	7%	50%	42%	27%
	2016	50%	55%	60%	9%	-9%	32%	11%	16%
	2017	14%	45%	28%	9%	31%	193%	52%	27%
	2018	50%	57%	9%	10%	43%	125%	45%	29%
	2019	32%	23%	9%	25%	33%	-9%	77%	27%
Expense Ratio	2015	15%	73%	29%	14%	13%	35%	42%	65%
	2016	18%	106%	26%	15%	17%	43%	34%	75%
	2017	24%	27%	32%	19%	21%	44%	34%	81%
	2018	13%	91%	25%	13%	12%	26%	25%	58%
	2019	18%	49%	29%	17%	22%	26%	26%	84%
Combined Ratio	2015	36%	315%	30%	28%	19%	85%	84%	92%
	2016	68%	161%	86%	24%	7%	74%	45%	91%
	2017	38%	72%	60%	28%	52%	237%	86%	108%
	2018	38%	72%	60%	28%	52%	237%	86%	87%
	2019	38%	72%	60%	28%	52%	237%	86%	111%

**Combined ratios:*

- *The combined ratios by line of business exclude management expenses.*
- *The combined ratios in the total column include management expenses and are a true reflection of the profitability of the business.*

Appendix 6: Economic Capital Methodology & Stress Level Derivation.

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

6 <u>MARKET RISKS</u>

6.1.1 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.

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

6.1.3 Credit spread and liquidity risks have not been explicitly calculated for the following reasons:

- Credit spread – the company has no Corporate bond holdings as part of assets backing technical provisions and hence no credit risk exposure.
- Liquidity risk – this is a difficult risk to quantify within the economic calculations. The Company is recommended to ensure that a robust Liquidity management policy is in place in order to be able to monitor this risk.

6.1.4 Concentration and foreign currency risks were also considered.

- Concentration risk – the Company is diversified in its investments e.g. equities by sector; for cash holdings, there is limited exposure for the Company in terms of equity holdings in the banks where cash is held. For this purpose, this risk was considered not significant and not modelled explicitly
- Foreign currency risk - the company has some exposure to currency risk as some of its major line of business e.g. Oil & Gas have potential liabilities that are dollar dominated. However, we note from the financial statements that the company have equivalent matching assets the liabilities.

6.1.5 The market risk capital requirement $\boldsymbol{C_{Mkt}}$ 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

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

Asset class	Stress level @ 95%	Stress level @ 99.5%
Equity	29.1%	41.5%
Property	30.6%	39.5%
Interest rate	24%	35%
Currency	29%	13%

6.1.7 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 also benchmarking against the Solvency II widely used stress levels.

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

6.1.9 **Equity risk**

6.1.9.1 This is the sensitivity of assets, liabilities and financial investments to fluctuations in the level or volatility of the market prices for equities.

6.1.9.2 The company is invested in both quoted and unquoted equities. Both types of equities were stress tested.

6.1.9.3 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.

6.1.9.4 We fitted the NSE historical index values from January 1985 to December 2022. The normal distribution was a good fit for the data. Using the normal distribution, we determined stress levels of 29% and 41% for confidence levels of 95% and 99.5% respectively.

6.1.9.5 We also checked how frequently historical annual returns have fallen or been close to the 29.1% and 41.5% levels. In 2008, the stock index fell by about 46% and in 2011 also fell by about 23%.

6.1.9.6 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.

6.1.10 **Property risk**

6.1.10.1 This is the sensitivity of assets, liabilities and financial investments to fluctuations in the level or volatility of the market prices for properties.

6.1.10.2 The main downside risk is the fall in property values.

6.1.10.3 The local market level of stress for this risk was difficult to obtain given the non-existence of property indices or well defined historical property values in the local market.

6.1.10.4 In order to derive an appropriate stress, we assumed the property returns would follow closely equity returns but slightly better and less risky. This is a unique feature of the local market. The recent past has shown m positive performance of property investments whilst equity returns have been negative in some instances.

6.1.10.5 We then assumed annual property returns of 15% with standard deviation of 9.5%. Assuming a normal distribution of returns, we then calculated the relevant stress levels at 95%, 99.5%, 99.75% and 99.95% confidence levels as shown in the table 3 above respectively.

6.1.10.6 To support the notion of better property returns is the fact that the company is invested in properties mainly in the Lagos State. Property values have been on an increase over the last 20 years, so it is hoped that the trend will continue in the near to medium term. However, this assumption will continue to be monitored in the future computation of economic capital.

6.1.11 **Interest Rate risk**

6.1.11.1 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.

6.1.11.2 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.

6.1.11.3 The historical returns were fitted to distributions to determine the best fit distribution. The Uniform and Normal distributions were both good fit. The normal distribution was used instead in order to apply some consistency with the other market risk stresses.

6.1.11.4 As the local term structure of interest rates show a flat yield curve; a flat stress level was applied to bonds of varying durations.

6.1.11.5 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.

6.1.11.6 The stressed yields were applied using the formula: current yield x (1+Upward stress) OR current yield x (1+Downward stress).

6.1.11.7 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}

6.1.12 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)

6.1.13 The correlation matrix used is shown in Appendix 7

6.1.14 **Non-Life Insurance risks**

6.1.14.1 The non-life insurance risks modelled were:

- Reserving risk
- Premium risk
- Catastrophe risk

6.1.14.2 **Reserving risk**

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

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

6.1.14.5 The reserve risk methodology was as follows:

- We fitted a log-normal distribution (best fit) to the historical link ratios for each claims development year
- For each accident year, claims were projected to the ultimate position using a factor derived from the parameters of the fitted model and randomly generated numbers
- We then used the bootstrap approach to derive a distribution of ultimate claims
- Reserve capital is the difference between the 95th-percentile of the distribution and the 50th -percentile (Best estimate)
- Because the volume of data available was not credible enough for the bootstrap approach, capital values for Oil & Gas and Aviation were calculated using the expected ultimate loss ratio method. The VaR approach was used in calculating the required capital at various confidence levels.

6.1.14.6 **Premium risk**

6.1.14.7 This is another source of underwriting risk for general insurance.

6.1.14.8 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.

6.1.14.9 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 normal distribution was fit (which was the best fit) to the deviations
- The VaR approach was then used to compute the capital requirement at 95% confidence level.

6.1.14.10 **Catastrophe risk**

6.1.14.11 This is Catastrophe for the general insurance business.

6.1.14.12 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.

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

6.1.14.14 The catastrophe risk methodology was therefore as follows:

- The 2022 loss ratios were increased by 500% for all lines of business to resemble a catastrophic-like event
- A 0.5% probability of occurrence was applied to determine the final capital requirement.

6.2 <u>CREDIT RISK</u>

6.2.1 Credit risk arises as a result of the unexpected default, or deterioration in credit standing, of an insurer’s counterparties or debtors.

6.2.2 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.

6.2.3 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.

6.2.4 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	0.01%
AA+	0.01%
AA	0.02%
AA-	0.03%
A+	0.06%
A	0.09%
A-	0.11%
BBB+	0.16%
BBB	0.22%
BBB-	0.39%
BB+	0.54%
BB	0.81%
BB-	1.39%
B+	2.54%
B	5.37%
B-	8.72%
Unrated	26.53%

6.2.5 The above default rates were applied to both the banks and reinsurers' counterparties to the Company.

6.2.6 The formula used was: Estimated exposure x Probability of Default.

6.3 OPERATIONAL RISK

6.3.1 This is the risk of loss arising from inadequate or failed internal processes, or from personnel and systems, or from external events.

6.3.2 Operational risk is generally a material risk and one of the major causes of organizational failure.

6.3.3 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 number 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.

6.3.4 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.

6.3.5 The formula used to compute the capital requirement was as follows:

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

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

CR_{op} is the preliminary capital required before allowing operational risk and, for the risk requirements it is defined as:

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

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

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

Where

$$Op_{premiums} = 0.04\ \times\ Earn_{nl}\ + Max\,\{0, 0.04\ \times\ [Earn_{nl} -\ 1.1\ \times pEarn_{nl}]\}$$

and $Op_{provisions} = 0.0045\ \times Max\,\{0, Tp_{nl}\}$

$Earn_{nl}$ 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

6.3.6 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 7 – 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					
$Corr_{ij}$	Mkt_{int}	Mkt_{eq}	Mkt_{prop}	Mkt_{sp}	Mkt_{conc}	Mkt_{fx}
Mkt_{int}	100%	0%	0%	0%	0%	25%
Mkt_{eq}	0%	100%	25%	75%	0%	25%
Mkt_{prop}	0%	25%	100%	50%	0%	25%
Mkt_{sp}	0%	75%	50%	100%	0%	25%
Mkt_{conc}	0%	0%	0%	0%	100%	0%
Mkt_{fx}	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.