ERM Case Study

Introduction and Recommendations

The case study is an integral part of the study material for the ERM exam. Some exam questions will be based on the material provided in this document.

This case study presents information for the following companies:

- Caerus Consulting (a global risk management and advisory consulting firm) and its clients (including financial, automotive, and energy companies)
- Lyon Corporation (a financial services holding company)
- Simple Life Insurance Company (SLIC)
- AHA Health (a health insurance company)
- Helios (a non-U.S. insurance company)
- Various other companies that are potential partners or acquisition candidates

The case study is organized into sections. Candidates are responsible for reviewing all of the material in the case study.

You are encouraged to read this case study in conjunction with the recommended study materials. This will help you become familiar with the information that is provided in this case study and assist you in putting syllabus readings in context. The case study should be read critically, with the understanding that it is meant to depict hypothetical organizations with some good policies and some flaws; it is not a representation of best practices.

It is important that you become familiar with the information presented in the case study that may pertain to the questions you will attempt in the exam. All candidates are expected to think about ERM holistically and how the issues raised in the exam case study questions will affect the ERM processes of the organization as a whole.

An electronic copy of this case study will be provided to you at the exam. You will not be allowed to bring your copy of this case study into the exam room.

The following table of contents should assist you in locating information within the case study.

This and the following pages contain tables for the standard normal distribution. These tables will be available as part of this case study at the examination and are for use in solving all problems on the examination, including those not related to the case study.

TABLES FOR THE STANDARD NORMAL DISTRIBUTION

Values of z for selected probabilities that $Z \le z$.

$\Pr(Z \le z)$	0.800	0.850	0.900	0.950	0.975	0.990	0.995
z	0.842	1.036	1.282	1.645	1.960	2.326	2.576

Table for $N(x)$ when $x \geq 0$. Use interpolation with these tables. For example, $N(0.6278) = N(0.62) + 0.78[N(0.63) - N(0.62)] = 0.7324 + 0.78(0.7357 - 0.7324) = 0.7350$.

x	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.5000	0.5040	0.5080	0.5120	0.5160	0.5199	0.5239	0.5279	0.5319	0.5359
0.1	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753
0.2	0.5793	0.5832	0.5871	0.5910	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141
0.3	0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.6480	0.6517
0.4	0.6554	0.6591	0.6628	0.6664	0.6700	0.6736	0.6772	0.6808	0.6844	0.6879
0.5	0.6915	0.6950	0.6985	0.7019	0.7054	0.7088	0.7123	0.7157	0.7190	0.7224
0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7517	0.7549
0.7	0.7580	0.7611	0.7642	0.7673	0.7704	0.7734	0.7764	0.7794	0.7823	0.7852
0.8	0.7881	0.7910	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133
0.9	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.8340	0.8365	0.8389
1.0	0.8413	0.8438	0.8461	0.8485	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621
1.1	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.8770	0.8790	0.8810	0.8830
1.2	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.8980	0.8997	0.9015
1.3	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9131	0.9147	0.9162	0.9177
1.4	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9279	0.9292	0.9306	0.9319
1.5	0.9332	0.9345	0.9357	0.9370	0.9382	0.9394	0.9406	0.9418	0.9429	0.9441
1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9545
1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633
1.8	0.9641	0.9649	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9699	0.9706
1.9	0.9713	0.9719	0.9726	0.9732	0.9738	0.9744	0.9750	0.9756	0.9761	0.9767
2.0	0.9772	0.9778	0.9783	0.9788	0.9793	0.9798	0.9803	0.9808	0.9812	0.9817
2.1	0.9821	0.9826	0.9830	0.9834	0.9838	0.9842	0.9846	0.9850	0.9854	0.9857
2.2	0.9861	0.9864	0.9868	0.9871	0.9875	0.9878	0.9881	0.9884	0.9887	0.9890
2.3	0.9893	0.9896	0.9898	0.9901	0.9904	0.9906	0.9909	0.9911	0.9913	0.9916
2.4	0.9918	0.9920	0.9922	0.9925	0.9927	0.9929	0.9931	0.9932	0.9934	0.9936
2.5	0.9938	0.9940	0.9941	0.9943	0.9945	0.9946	0.9948	0.9949	0.9951	0.9952
2.6	0.9953	0.9955	0.9956	0.9957	0.9959	0.9960	0.9961	0.9962	0.9963	0.9964
2.7	0.9965	0.9966	0.9967	0.9968	0.9969	0.9970	0.9971	0.9972	0.9973	0.9974
2.8	0.9974	0.9975	0.9976	0.9977	0.9977	0.9978	0.9979	0.9979	0.9980	0.9981
2.9	0.9981	0.9982	0.9982	0.9983	0.9984	0.9984	0.9985	0.9985	0.9986	0.9986
3.0	0.9987	0.9987	0.9987	0.9988	0.9988	0.9989	0.9989	0.9989	0.9990	0.9990
3.1	0.9990	0.9991	0.9991	0.9991	0.9992	0.9992	0.9992	0.9992	0.9993	0.9993
3.2	0.9993	0.9993	0.9994	0.9994	0.9994	0.9994	0.9994	0.9995	0.9995	0.9995
3.3	0.9995	0.9995	0.9995	0.9996	0.9996	0.9996	0.9996	0.9996	0.9996	0.9997
3.4	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9997	0.9998
3.5	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998	0.9998
3.6	0.9998	0.9998	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999
3.7	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999
3.8	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999	0.9999
3.9	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Table for $N(x)$ when $x \leq 0$. Use interpolation (entries are for the row value *minus* the column value). For example, $N(-0.1234) = N(-0.12) - 0.34[N(-0.12) - N(-0.13)] = 0.4522 - 0.34(0.4522 - 0.4483) = 0.4509$.

z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.5000	0.4960	0.4920	0.4880	0.4840	0.4801	0.4761	0.4721	0.4681	0.4641
-0.1	0.4602	0.4562	0.4522	0.4483	0.4443	0.4404	0.4364	0.4325	0.4286	0.4247
-0.2	0.4207	0.4168	0.4129	0.4090	0.4052	0.4013	0.3974	0.3936	0.3897	0.3859
-0.3	0.3821	0.3783	0.3745	0.3707	0.3669	0.3632	0.3594	0.3557	0.3520	0.3483
-0.4	0.3446	0.3409	0.3372	0.3336	0.3300	0.3264	0.3228	0.3192	0.3156	0.3121
-0.5	0.3085	0.3050	0.3015	0.2981	0.2946	0.2912	0.2877	0.2843	0.2810	0.2776
-0.6	0.2743	0.2709	0.2676	0.2643	0.2611	0.2578	0.2546	0.2514	0.2483	0.2451
-0.7	0.2420	0.2389	0.2358	0.2327	0.2296	0.2266	0.2236	0.2206	0.2177	0.2148
-0.8	0.2119	0.2090	0.2061	0.2033	0.2005	0.1977	0.1949	0.1922	0.1894	0.1867
-0.9	0.1841	0.1814	0.1788	0.1762	0.1736	0.1711	0.1685	0.1660	0.1635	0.1611
-1.0	0.1587	0.1562	0.1539	0.1515	0.1492	0.1469	0.1446	0.1423	0.1401	0.1379
-1.1	0.1357	0.1335	0.1314	0.1292	0.1271	0.1251	0.1230	0.1210	0.1190	0.1170
-1.2	0.1151	0.1131	0.1112	0.1093	0.1075	0.1056	0.1038	0.1020	0.1003	0.0985
-1.3	0.0968	0.0951	0.0934	0.0918	0.0901	0.0885	0.0869	0.0853	0.0838	0.0823
-1.4	0.0808	0.0793	0.0778	0.0764	0.0749	0.0735	0.0721	0.0708	0.0694	0.0681
-1.5	0.0668	0.0655	0.0643	0.0630	0.0618	0.0606	0.0594	0.0582	0.0571	0.0559
-1.6	0.0548	0.0537	0.0526	0.0516	0.0505	0.0495	0.0485	0.0475	0.0465	0.0455
-1.7	0.0446	0.0436	0.0427	0.0418	0.0409	0.0401	0.0392	0.0384	0.0375	0.0367
-1.8	0.0359	0.0351	0.0344	0.0336	0.0329	0.0322	0.0314	0.0307	0.0301	0.0294
-1.9	0.0287	0.0281	0.0274	0.0268	0.0262	0.0256	0.0250	0.0244	0.0239	0.0233
-2.0	0.0228	0.0222	0.0217	0.0212	0.0207	0.0202	0.0197	0.0192	0.0188	0.0183
-2.1	0.0179	0.0174	0.0170	0.0166	0.0162	0.0158	0.0154	0.0150	0.0146	0.0143
-2.2	0.0139	0.0136	0.0132	0.0129	0.0125	0.0122	0.0119	0.0116	0.0113	0.0110
-2.3	0.0107	0.0104	0.0102	0.0099	0.0096	0.0094	0.0091	0.0089	0.0087	0.0084
-2.4	0.0082	0.0080	0.0078	0.0075	0.0073	0.0071	0.0069	0.0068	0.0066	0.0064
-2.5	0.0062	0.0060	0.0059	0.0057	0.0055	0.0054	0.0052	0.0051	0.0049	0.0048
-2.6	0.0047	0.0045	0.0044	0.0043	0.0041	0.0040	0.0039	0.0038	0.0037	0.0036
-2.7	0.0035	0.0034	0.0033	0.0032	0.0031	0.0030	0.0029	0.0028	0.0027	0.0026
-2.8	0.0026	0.0025	0.0024	0.0023	0.0023	0.0022	0.0021	0.0021	0.0020	0.0019
-2.9	0.0019	0.0018	0.0018	0.0017	0.0016	0.0016	0.0015	0.0015	0.0014	0.0014
-3.0	0.0013	0.0013	0.0013	0.0012	0.0012	0.0011	0.0011	0.0011	0.0010	0.0010
-3.1	0.0010	0.0009	0.0009	0.0009	0.0008	0.0008	0.0008	0.0008	0.0007	0.0007
-3.2	0.0007	0.0007	0.0006	0.0006	0.0006	0.0006	0.0006	0.0005	0.0005	0.0005
-3.3	0.0005	0.0005	0.0005	0.0004	0.0004	0.0004	0.0004	0.0004	0.0004	0.0003
-3.4	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0003	0.0002
-3.5	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
-3.6	0.0002	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
-3.7	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
-3.8	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
-3.9	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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1 Caerus Consulting

1.1 Overview

Caerus Consulting is a global risk management and advisory company with headquarters in Boston, MA (USA). Caerus has offices worldwide including Madrid (Spain), Singapore, and

Shanghai (China). The firm has been in business since 1950, starting out as an automotive industry consultant. In 1976 Caerus expanded into the energy industry and then continued expanding into other markets beginning in 2000. A summary of the company and its clients as of 2023 follows.

1.2 Mission Statement

Caerus Consulting is committed to helping clients turn risk into opportunity. We develop and help implement solutions for:

- Managing risk
- Expansion and growth
- Strengthening core markets

Caerus Consulting believes in an innovative work environment that values creativity, diversity and mutual respect.

1.3 Services

- Strategic and Corporate Risk
  - Mergers and Acquisitions
  - New Market Explorations and Investments
- Insurance and Investment Risk
  - Insurance Regulatory Requirements
    - NAIC (U.S. Solvency): ORSA, RBC, etc.
    - MCCSR (Canadian Solvency)
    - Solvency II
  - Reinsurance
- Accounting Advisory Services
  - Provide guidance on current IFRS, U.S. GAAP, and other global accounting regulations.

1.4 Industries

- Automotive

  Caerus has significant experience in this industry, providing consulting to over 20 companies. The firm faced considerable scrutiny ten years ago as it was the advisor to U.S.-based Alpha Automotive at the time that Alpha went into bankruptcy.

- Energy and Power

  Caerus began consulting with global energy companies shortly after the energy crisis of the 1970s. The original consulting focus was on helping energy companies cope with volatile oil prices, complex government regulations, and global competition, but lately Caerus has been asked to consult more on the impact of climate change.

- Insurance

  In 2004 Caerus Consulting merged with an existing insurance consultant in order to expand into this market. The insurance consultant had been in business for over 50 years and had

200 employees, located in offices in Europe and the U.S. This branch is currently doing very well, providing guidance for all lines of insurance on financial, strategic, operational, human capital, and data management issues. Caerus is beginning to offer consulting services on the use of robotics and AI for insurance.

- Banking

  Caerus expanded into the banking industry five years ago. The firm is relying on its insurance industry expertise and a few specialized banking consultants to keep this group going. Caerus has had success with some smaller banks in Africa and the U.S. and would like to branch out to the larger banks in Europe and Asia.

- Tourism

  This is a new industry for Caerus. The expansion to this field was driven by one of the newest board members who felt it would increase the diversity of the company. Consultants whose primary focus has been the automotive industry were asked to work with three new consultants with hotel and tourism experience.

1.5 Financial Engagement – Big Ben Bank

Caerus has analyzed the banking industry and considers its primary risks to be the following:

Banking Industry Key Risks

Strategic/Business Risks

- Significant competition in the rapidly evolving global financial services industry
- Reputational risk for banks

Profitability and Liquidity Risks

- Risks relating to models and assumptions
- Credit risk
- Liquidity risk
- Risk of adverse changes in market risk factors

Operational Risk

- Operational risk resulting from inadequate or failed internal processes and systems

Compliance

- Regulatory capital risk due to increasing stringency of banking regulations
- Fraud or conduct risks due to detrimental practices

Technology

- Competition and disruption emerging from new financial technology firms which develop new services and products based on innovative technologies including cloud, big data analytics, internet of things, and digital payments processes
- Cyber-security breaches

Company Overview

Big Ben Bank is a mid-sized bank domiciled in Luxembourg that operates primarily in European financial centers. Big Ben is a full-service bank, but its primary focus has been to provide exclusive wealth management services to high net worth clients.

Products / Services

Asset Management

Big Ben Bank is a world leader in the exchange-traded fund (ETF) market and has a strong brand and a loyal investor base. Big Ben's asset management products cover a comprehensive list of asset classes including equities, fixed income, real estate, private equity, and sustainable investments. In addition to ETFs, Big Ben offers mutual funds and separately managed accounts.

Advisory teams manage client relationships, provide advice, and enable clients to access Big Ben's asset management products and services. Big Ben also markets its offerings through its Commercial Banking division.

Since its inception, the critical profit driver has been the excess of the management expense ratio (MER) charged on the assets under management over the operational costs of fulfilling the fund management mandate. But MERs for ETFs are coming under increased downward pressure as more competitors come into this fund arena.

Commercial Banking

Traditional commercial banking has been a smaller, but significant, component of Big Ben's revenue pie. The Commercial Banking division's clients are individuals (retail banking) and small businesses. Products offered are checking account services; business, personal, and mortgage loans; and basic financial products such as certificates of deposit (CDs) and savings accounts. The operational model of the commercial banking division is primarily online, rather than through physical branches. This approach was meant to meet the needs of a globally mobile clientele. The physical distribution model is almost non-existent and cannot support broad-based banking.

Big Ben's Private Banking group provides a suite of services to high-net-worth individuals designed to grow wealth. In addition to the traditional commercial banking services, Big Ben provides custom-designed investment, tax, and estate planning solutions. The Private Banking group makes use of Big Ben's Asset Management products as part of its financial planning services.

Investment Banking

Big Ben has a small investment banking division which provides services related to the creation of capital for companies, governments, and other entities. Big Ben underwrites new debt and equity securities, aids in the sale of securities, facilitates mergers and acquisitions, and provides guidance to issuers regarding the issue and placement of stock.

Strategy

Big Ben's strategic plans include expansion of the Investment Banking and Asset Management businesses over the next year. Future plans include an expansion of the Commercial Banking business in the next three to five years.

Big Ben's strategy also includes an expansion of its client base. It will be a priority to lower the minimum investable assets requirement for participation in the services that had been traditionally offered exclusively to the bank's high-net-worth customers. The bank will also offer more holistic wealth management and financial planning services. Big Ben's excess economic capital will be deployed to fund the expansion.

The executive mindset has been to increase focus on the financial planning sales approach and to formulate a one-stop shopping interface to its globally mobile clientele. Big Ben believes that its expertise in emerging technologies will facilitate the execution of this strategy.

Risk Management

Big Ben Bank is committed to maintaining a strong capital base to support the risks associated with its businesses. Strength in capital management contributes to safety for Big Ben's customers, fosters investor confidence, and supports high credit ratings, while allowing the bank to take advantage of growth opportunities as they arise and to enhance shareholder returns through increased dividends and share repurchases.

Big Ben recognizes that liquidity risk is significant for banks. It monitors the contractual maturities of its assets and liabilities (See Exhibit B). Big Ben is considering introducing a Liquidity Assessment Program to enhance its liquidity risk management.

As part of Big Ben's asset liability management (ALM) process, the durations of the asset and liability portfolios are monitored, and the duration mismatch is not allowed to exceed a specified tolerance. The Board recently voted to establish an Asset Liability Management Committee (ALMCo) to oversee interest rate risk. The Chair of the ALMCo will be a recently hired senior manager from the insurance industry with significant asset liability management experience. The first job of the ALMCo will be to draft an ALM policy statement for approval by the Board. A key metric will be to calculate the sensitivity of assets and liabilities to changes in interest rates. The Board wants to be able to withstand a 200 bp parallel shift in the yield curve.

Big Ben uses various models to manage risks and to provide insight into decision making. The most important ones are as follows:

- A model to capture the correlation between mortgage prepayment rates and interest rates using statistical best fit techniques
- An internal model to calculate VaR for the trading book
- An economic capital model based on VaR to determine the amount of required economic capital

Big Ben uses frequency tests to validate VaR risk models based on the number of losses exceeding VaR and a significance level.

Economic Capital

Big Ben uses internal models to determine its required economic capital based on VaR. The quantile used for the VaR calculation is 99.5% over a one-year horizon. The business is modeled as a going concern, and the model has four components: credit risk, market risk, operational risk, and business risk.

Credit risk is estimated assuming there is common dependence of borrowers on systematic risk factors, such as country, region, or industry. These risk factors are assumed to fluctuate over time and follow a joint normal distribution. All borrowers are linked to these underlying systematic risk factors to varying degrees and the factors are assumed to move in a correlated way. Results are derived from loss distributions generated using Monte Carlo simulations.

Market risk includes interest rate risk, currency risk and equity market risk. These risks are measured using stochastic simulation. Big Ben's mortgage pre-payment risk model is utilized as part of the economic capital model. Assumptions about customer retention and repricing of interest crediting rates for deposits are also important behavioral assumptions used in the model.

Operational risk is measured through a simple add-on model which estimates the impacts of individual operational risks and aggregates them using simple correlation assumptions. Big Ben has considered more sophisticated modeling but has found it difficult to identify a single loss distribution function because operational risk loss data is distributed in two different manners: (i) loss data with high frequency and low magnitude that composes the body of the distribution; and (ii) loss data with low frequency and high magnitude that composes the tail distribution.

Strategic/Business Risk is the probability of loss related to the organization's environment (such as competition, overall economic climate, and government regulation) and sub-optimal business decisions in response to that environment. Big Ben uses scenario analysis to quantify economic capital for business risk.

The diversification benefit is measured using a variance-covariance matrix. This has the benefit of being relatively simple and intuitive, but the correlations are difficult to obtain. As a result, the correlations are updated infrequently. Big Ben has considered other methods of measuring the diversification benefit such as combining the marginal distributions through copula functions.

The economic capital is calculated in aggregate for the company by a team in the Corporate Treasury department. The results are updated quarterly. Allocation of economic capital to the business divisions is done based on simple rules of thumb and is done only upon request. As the EC models impact financial reporting, they are inventoried in the model governance system and subject to formal validation. However, validation of these component models is not scheduled until next year due to the backlog of other validations. As such, the developers are still in the process of completing the model documentation, including the implementation and change management testing, where applicable.

Capital adequacy is assessed as the ratio of the total available economic capital to the total required economic capital. Big Ben requires that each line of business maintain an Internal Capital Adequacy Ratio of 140%.

Capital Adequacy Analysis		
in millions of euros	**Dec 31, 2022**	Dec 31, 2021
Economic capital requirement		
Credit risk	**354**	370
Market risk	**394**	471
Operational risk	**283**	277
Business risk	**138**	160
Diversification benefit	**(212)**	(239)
Total required economic capital	**958**	1,039
Total available economic capital	**1,555**	1,642
Internal capital adequacy ratio	**162 %**	158 %

Value-at-Risk for Trading Book

Big Ben's trading book is its portfolio of financial instruments classified as available for sale. The financial instruments in the trading book are purchased or sold for reasons including: facilitating trading for the institution's customers, earning profits from trading spreads between the bid and ask prices, or hedging against various types of risk.

Big Ben's value-at-risk (VaR) for the trading book is based on an internal model. Regulatory authorities have approved the internal model for calculating the regulatory market risk capital for general and specific market risks. VaR is calculated using a 99 % confidence level and a one day holding period.

The model uses one year of historical market data as input to calculate VaR. The calculation employs a Monte Carlo Simulation technique and assumes that changes in risk factors follow a well-defined distribution, e.g., normal distribution or t-distribution. To determine aggregated VaR, Big Ben uses observed correlations between the risk factors during this one-year period.

The VaR model is designed to take into account a comprehensive set of risk factors across all asset classes. Key risk factors are swap curves, index and issuer-specific credit curves, funding spreads, single equity and index prices, foreign exchange rates, and commodity prices as well as their implied volatilities.

A separate VaR is calculated for each risk type, e.g., interest rate risk, credit spread risk, equity risk, foreign exchange risk, and commodity risk. For each risk type this is achieved by deriving the sensitivities to the relevant risk type and then simulating changes in the associated risk drivers. Diversification reflects the fact that the total VaR on a given day will be lower than the sum of the VaR relating to the individual risk types.

VaR metrics are shown below:

99% VaR of Big Ben Bank's Trading Book by Risk Type

in thousands of euros	Total		Diversification effect		Interest rate risk		Credit spread risk		Equity price risk		Foreign exchange risk		Commodity price risk	
	2022	2021	**2022**	2021	**2022**	2021	**2022**	2021	**2022**	2021	**2022**	2021	**2022**	2021
Average	**805**	865	**(759)**	(946)	**546**	532	**532**	719	**235**	251	**227**	289	**22**	19
Maximum	**1,038**	1,605	**(1,016)**	(1,557)	**703**	797	**678**	878	**338**	1,416	**446**	451	**81**	89
Minimum	**543**	551	**(578)**	(692)	**365**	400	**365**	603	**119**	119	**114**	97	**3**	5
Period-end	**786**	814	**(608)**	(997)	**578**	538	**389**	657	**273**	270	**132**	341	**19**	5

Big Ben Bank Exhibits

Exhibit A - Financial Statements

2022 Annual Report – Big Ben

Consolidated Statement of Income

in millions of euros	**2022**	**2021**	**2020**
Interest income	693	702	676
Interest expense	295	273	290
Net interest income	**397**	**429**	**386**
Provision for credit losses	37	26	31
Net interest income after provision for credit losses	**360**	**403**	**355**
Commissions and fee income	317	345	335
Net gains (losses) on financial assets/liabilities at fair value through profit or loss	38	104	116
Net gains (losses) on financial assets available for sale	18	5	7
Net income (loss) from equity method investments	12	4	17
Other income (loss)	28	18	3
Total noninterest income	**414**	**477**	**478**
Compensation and benefits	321	359	338
General and administrative expenses	428	510	404
Impairment of goodwill and other intangible assets	34	156	3
Restructuring activities	13	19	4
Total noninterest expenses	**796**	**1,045**	**749**
Income (loss) before income taxes	**(22)**	**(165)**	**84**
Income tax expense	**15**	**18**	**39**
Net income (loss)	**(37)**	**(183)**	**46**

Big Ben – Annual Report 2022
Consolidated Balance Sheet

in millions of euros	**Dec 31, 2022**	**Dec 31, 2021**
Assets:		
Cash and central bank balances	4,902	2,620
Interbank balances (w/o central banks)	314	347
Central bank funds sold and securities purchased under resale agreements	440	607
Securities borrowed	543	907
Financial assets at fair value through profit or loss		
Trading assets	4,623	5,298
Positive market values from derivative financial instruments	13,112	13,935
Financial assets designated at fair value through profit or loss	2,367	2,953
Total financial assets at fair value through profit or loss	20,102	22,186
Financial assets available for sale	1,520	1,989
Equity method investments	28	27
Loans	11,052	11,561
Securities held to maturity	87	0
Property and equipment	76	77
Goodwill and other intangible assets	243	272
Other assets	3,407	3,193
Assets for current tax	42	35
Deferred tax assets	234	210
Total assets	**42,988**	**44,031**
Liabilities and equity:		
Deposits	14,870	15,324
Central bank funds purchased and securities sold under repurchase agreements	696	265
Securities loaned	97	88
Financial liabilities at fair value through profit or loss		
Trading liabilities	1,541	1,414
Negative market values from derivative financial instruments	12,537	13,353
Financial liabilities designated at fair value through profit or loss	1,635	1,212
Investment contract liabilities	16	230
Total financial liabilities at fair value through profit or loss	15,729	16,210
Other short-term borrowings	467	757
Other liabilities	4,201	4,730
Provisions	297	249
Liabilities for current tax	36	46
Deferred tax liabilities	13	20
Long-term debt	4,657	4,325
Trust preferred securities	172	190
Total liabilities	**41,236**	**42,203**
Common shares, valued at nominal value per share	95	95
Additional paid-in capital	913	907
Retained earnings	513	572
Accumulated other comprehensive income (loss), net of tax	96	119
Total shareholders' equity	**1,617**	**1,694**
Additional equity components	126	126
Noncontrolling interests	9	7
Total equity	**1,752**	**1,828**
Total liabilities and equity	**42,988**	**44,031**

Big Ben Bank Exhibit B

Maturity of Assets and Liabilities

Analysis of the Earliest Contractual Maturity of Assets

Dec 31, 2022								
in millions of eruos	On demand (incl. Overnight and one day notice)	Up to one month	Over 1 month to no more than 6 months	Over 6 months but no more than 1 year	Over 1 year but no more than 2 years	Over 2 years but no more than 5 years	Over 5 years	Total
Cash and central bank balances	4,801	15	7	79	0	0	0	4,902
Interbank balances (w/o central banks)	158	97	18	24	3	1	13	314
Securities borrowed	528	14	0	0	0	0	0	543
Trading assets	4,623	0	0	0	0	0	0	4,623
Positive market values from derivative financial instruments	13,112	0	0	0	0	0	0	13,112
Financial assets designated at fair value through profit or loss	581	900	306	75	81	76	348	2,367
Financial assets available for sale	13	31	91	114	249	508	514	1,520
Loans to banks	25	53	148	35	41	35	21	359
Loans to customers	471	586	1,350	458	737	1,759	5,332	10,693
Other financial assets	2,839	128	285	64	21	87	175	3,598
Total financial assets	**27,151**	**1,825**	**2,205**	**848**	**1,132**	**2,465**	**6,404**	**42,030**
Other assets	635	0	0	0	0	0	323	958
Total assets	**27,786**	**1,825**	**2,205**	**848**	**1,132**	**2,465**	**6,726**	**42,988**

Analysis of the Earliest Contractual Maturity of Liabilities

Dec 31, 2022								
in millions of eruos	On demand (incl. Overnight and one day notice)	Up to one month	Over 1 month to no more than 6 months	Over 6 months but no more than 1 year	Over 1 year but no more than 2 years	Over 2 years but no more than 5 years	Over 5 years	Total
Deposits due to banks	1,742	260	416	281	51	145	243	3,138
Deposits due to retail customers	2,971	291	2,127	72	21	25	8	5,514
Deposits due to corporate customers	4,200	439	920	414	158	48	40	6,218
Trading securities	1,541	0	0	0	0	0	0	1,541
Negative market values from derivative financial instruments	12,537	0	0	0	0	0	0	12,537
Financial liabilities designed at fair value through profit or loss	54	1,045	279	121	28	27	80	1,635
Short term borrowings	1,003	66	91	81	12	7	0	1,260
Long-term debt	0	28	363	387	1,171	1,526	1,184	4,657
Other financial liabilities	3,470	33	85	80	146	43	111	3,968
Total financial liabilities	**27,518**	**2,161**	**4,282**	**1,435**	**1,587**	**1,820**	**1,665**	**40,469**
Other liabilities	767	0	0	0	0	0	0	767
Total liabilities	**28,285**	**2,161**	**4,282**	**1,435**	**1,587**	**1,820**	**1,665**	**41,236**

Big Ben Bank Exhibit C
Selected Economic Capital Model Results

I. Worst 15 of 1000 scenarios from the credit risk model from the March 31, 2023 model:

Scenario rank	Credit risk scenario #	Credit risk scenario required capital
986	141	350
987	321	353
988	173	355
989	812	357
990	795	360
991	272	362
992	484	363
993	926	364
994	401	364
995	212	365
996	454	367
997	84	369
998	811	371
999	261	373
1000	142	376

II. Worst 15 of 1000 scenarios from the market risk model from the March 31, 2023 model:

Scenario rank	Market risk scenario #	Market risk scenario required capital
986	693	208
987	183	210
988	954	211
989	221	213
990	11	214
991	466	238
992	358	270
993	407	296
994	813	342
995	550	372
996	27	379
997	235	726
998	642	948
999	185	1034
1000	63	1137

III. Allocation of December 31, 2022 economic capital requirement to business divisions:

	Dec 31, 2022			
in millions of euros	**Asset Management**	**Commercial Banking**	**Investment Banking**	**Total**
Economic capital requirement				
Credit risk	177	106	71	**354**
Market risk	197	118	79	**394**
Operational risk	142	85	57	**283**
Business risk	69	41	28	**138**
Diversification benefit	(106)	(64)	(42)	**(212)**
Total required economic capital	**479**	**287**	**192**	**958**
Available economic capital	**778**	**466**	**311**	**1,555**

Big Ben has provided an internal memo with respect to its modeling processes, for Caerus' review.

To: Jennifer Oakhurst, Deputy CFO, Big Ben

From: Martin Willow, Financial Analyst, Big Ben

Subject: Model Governance

Date: April 12, 2023

Just wanted to give you a status update on the Model Governance framework project. Overall, the implementation is going well.

One of the first things we did was to decide upon the definition of a model, and then determined which models would be subject to the formal model validation aspects of the framework. Models that are excluded from model validation would still be subject to inventorying, documentation and change management controls.

We are defining models to include anything that forecasts values using judgment, approximations or assumptions. However, to be cost effective, we're only going to consider for validation models that are used for financial reporting purposes since these pose the most risk.

As alluded to above, we will create an inventorying system for both the models subject to model validation and those that aren't. For the ones that are subject to model validation, the model user(s) will rank each model as High, Medium or Low risk. The High-risk models will be validated on a strict 3-year rotation schedule through a centralized Model Validation group.

Models that are not subject to validation will still need to be reviewed by an independent analyst (i.e., somebody who was not the developer) who is familiar with the model's topic and purpose. This review will be qualitative in nature, with no formal report required, but the reviewer will have to sign off to ensure accountability.

Model documentation requirements include:

- Model purpose
- Significant model output and intended users
- Model methodology with extended commentary if the methodology is in any way considered unorthodox
- A summary of significant assumptions and their bases
- A summary of model testing
  - At implementation and at model revision
  - Ongoing testing
  - Validation testing, if applicable
- A summary of model controls and why they are considered effective and sufficient

Minimal requirements for input and calculation testing by the model developer are static and dynamic validation, respectively. This testing is performed upon model implementation, as well as expected for model change management purposes for material changes (see below). There is no formal testing requirement for output testing, but it is expected that developers will compare current model results to previous model results and qualitatively assess the movement in light of changes to inputs, assumptions or external environment.

We also will be formalizing change management requirements. The model developer will determine if a change is deemed material, and if so, will require a colleague to review both the coding change and model output for unintended consequences. Immaterial changes require the developer to self assess the change for accuracy. While no formal documentation is required, a change log is kept with applicable review signoffs.

The formal model validation exercise will require a report with a pass or fail grade, regardless of the findings. If the model fails, a remediation plan will need to be developed by the developer and executed in a timely manner. Since a model can have many attributes that require assessment, determining pass or fail will necessarily have to be judgmental. While the developer of a passing model is expected to implement suggested remediations, this is not a requirement since the model was deemed fit for purpose by the very definition of “passing”.

Every quarter, the Model Validation group will prepare a summary for executive leadership illustrating the total number of inventoried models, their passing status and the number of models reviewed during the period with their validation results.

Sincerely,

Martin Willow
Financial Analyst, Big Ben Bank

1.6 Automotive Consulting

Caerus' automotive consultants have prepared the following summary of the industry and its key risks.

Automotive Industry Overview

There are significant entry barriers to this industry, including:

- Heavy capital commitments for physical plant and research & development
- Specialized expertise in engines and transmissions, varying by market segment
- Long lead times from design to production
- Ability to anticipate consumer buying preferences

These entry barriers have led to a few dominant auto makers in each major auto manufacturing country. The ten largest companies have a 67% market share of the approximately 100 million of annual vehicle sales. 97% of these vehicles are Petroleum Combustion Vehicles (**PCV**s), which include gasoline, diesel and hybrid gasoline/battery vehicles. These large auto makers produce parts and assemble vehicles globally.

Industry Key Risks

Strategic Risks

- Many auto companies are exploring one or both of two initiatives: Battery Electric Vehicles (**BEV**s) and Driver Assistance features such as emergency braking, accident avoidance, and autonomous (self-driving) capabilities. Both of these initiatives require enormous investment, specialized expertise, and very long lead times from design to production. If these investments do not result in strong sales, large write-downs will occur.
- Customer willingness to change from PCVs, to BEVs is currently hindered by higher purchase prices, limited charging stations, longer "refueling" times, and generally lower driving ranges per "tankful" for BEVs. However, each of these differentials is narrowing. Electric motors of BEVs provide instant power throughout their range, reducing the importance of proprietary engine fuel economy and performance designs of PCV manufacturers.
- Driver Assistance features and self-driving, in particular, are turning out to be much more complex than anticipated, implying these will be costly options.

Profitability and Liquidity Risks

- PCV makers have three primary profit drivers – manufacturing profit, sales commissions, and dealer services. Currently, PCV dealers make more on maintenance than on car sales.
- BEVs have 80% fewer parts than PCVs. Thus, BEVs are significantly cheaper to maintain than PCVs. Battery recharging costs are significantly lower than gas/diesel costs. BEVs retain their resale values better than PCVs. Ultimately, the total cost of ownership (purchase price + fuel + maintenance – resale value) for BEVs will likely be comparable to that of PCVs.
- Batteries are the most expensive component of an electric vehicle, but it is expected that battery costs will drop significantly in the next five years, to the point where a BEV's

purchase price would be less than a PCV's. Futures contracts for lithium batteries were recently added to the commodities exchanges.

Operational Risk

- Production generally relies on "just-in-time" processes from a global supply chain. Interruptions in workplace availability (e.g., strikes), raw materials, parts suppliers and shipping could idle production.
- Factory changeovers (switching production from one type of vehicle to another) take 18 – 24 months, during which period the facility is off-line.

Compliance/Regulatory Risk

- Regulations restrict the level of automotive emissions and require onboard diagnostic systems. Automotive Emission requirements vary by area, with China, Europe, and the U.S. (particularly California), impacting PCV manufacturers the most. Failure in emissions or diagnostics must be remedied by recalls.
- Corporate Fuel Economy Standards must be met in each model year in the U.S., with civil penalties for non-compliance. China applies fuel economy standards both to individual vehicles and fleet averages.
- BEVs are not adversely impacted by emissions and fuel economy standards. BEV companies can sell Regulatory Credits to PCV manufacturers who need them.
- Many jurisdictions are planning to ban manufacture of new PCVs in the next five to fifteen years due to concerns that PCVs contribute significantly to global warming.

Litigation

- Cars with self-driving technology allow for collection of statistics on driver behavior and vehicle performance.
- Driver Assistance, particularly self-driving capabilities may generate legal and reputational risk as accidents occur. Currently, all such capabilities are "driver-assisted", which requires driver attention. However, if full self driving capabilities come into play, accident responsibility could shift to the manufacturer.

Caerus currently has two automotive clients, Giant Auto Motors and Disruptive Energy. Specifics for each company are discussed in the next two sections.

1.7 Giant Auto Motors (GAM)

Overview

Giant Auto Motors is an automobile manufacturer that designs, manufactures, markets, and services vehicles. It is the largest of the U.S. auto companies and in the top ten of global automobile manufacturers.

Products / Services

GAM currently sells cars, trucks and sport utility vehicles. Its leading sales are in luxury sedans, trucks, and SUVs. Like other major manufacturers, sales of parts and services for PCVs are the largest profit drivers.

Strategy

At times in its long history, GAM has been the largest auto maker in the world. At its peak, it sold more cars in the U.S. than all other manufacturers put together. Following a strategic assessment in 2021, it sold off half of its brands and now focuses on China and North America, which constitute 85% of its sales. It operates in the Chinese market via a joint venture (JV), under which GAM holds a 10% share.

After a recent board meeting, GAM concluded that it is vital to maintain a strong presence in the PCV market in the hope that continued profits from that business could be used to help cover the high upfront costs of entering the BEV market. However, the CEO is worried that staying in the PCV market is not a viable long-term strategy.

Pension Plan

GAM sponsors traditional defined benefit pension plans for most of its large workforce. Following are the abbreviated 2022/2023 financial results for GAM, including select results for the pension plans:

1/1/2023 Balance Sheet	(in billions)
Company Assets	144,600
Pension Assets	108,800
Total Assets	253,400
Company Liabilities	105,600
Pension Liabilities	134,200
Total Debt	239,800
Equity	13,600

Other 2022 Financial Information	(in billions)
Pretax Income	6,000
Components of Pension Expense	
Service Cost	900
Interest Cost	6,100
Expected Return on Assets	(7,500)
(Gain)/Loss Amortization	180
Prior Service Cost Amortization	10
Pension Contribution	2,000
Actual Pension Return	10,100

2022 Cash Flows	**(in 000s)**
Operating Cash Flow	7,500
Financing Cash Flow	750

2023 Assumptions	
Pension Liability Discount Rate	4.75%
PBGC Variable Rate Premium (as a % of unfunded liabilities)	3.00%

1.8 Disruptive Energy (DE)

Overview

Disruptive Energy is a new entrant in the automotive world. Its business includes related energy activities in BEVs, solar energy, and power generation.

- DE redefined the BEV market to include strong performance and significant driving range (300 miles/475 kilometers). Previously, BEV vehicles were considered to be glorified golf carts.
    - DE remains a niche player with 500,000 vehicles sold in 2022 from factories in California and Shanghai, China. However, it is building factories in Berlin, Germany and Texas, which will increase capacity.
    - DE relentlessly pursues efficiency and modifies processes quickly. For example, the Shanghai facility took one year from ground-breaking to vehicle production.
    - DE is a "vertically integrated" company which generally manages all processes in-house. After initially partnering with a battery manufacturer, it acquired its own battery expertise and is bringing battery production in-house. Its industry-leading driving range arises from DE's ability to optimize performance of all components holistically rather than separately for each component.
- DE bought a solar panel company and developed its own residential solar roof tiles. It sells solar power/battery back-up systems to homeowners.
- DE is leveraging its batteries, solar panels, and software to allow neighborhoods to generate their own electricity locally – reducing wildfire risks and power cutbacks.

These initiatives are led by a brash visionary – Lone Ox, who is active in social media and enjoys a large subscriber base. He plays a central role in planning, product design, introduction of new features, and timetables.

Products / Services

DE sells and services its electric cars and SUVs through a network of service centers. DE supplies a large and expanding number of rapid charging stations to facilitate long distance travel. The company provides regular, no-cost updates to its customers' software via wireless internet connections. At present, other manufacturers can only update vehicle software at dealerships.

DE is planning to manufacture a pick-up truck in the U.S., which is one of GAM's most profitable segments in the U.S. As DE's customer base grows, commensurate increases in parts, repair services, and charging options have become necessary.

In the residential market, DE markets and installs solar panels and solar tiles. In the utility market, DE's solar-powered back up systems have been installed in Australia, Hawaii, and Puerto Rico.

Battery design and management are key components underlying DE's vehicles, residential energy storage, and large-scale solar back-up systems. Current state-of-the-art car batteries are made of lithium, nickel, manganese, cobalt, and graphite. Except for manganese, 50% of the supplies originate in one or two countries. Cobalt is sourced primarily in a single country, which uses child labor in its mining operations.

DE recently introduced a cobalt-free battery in China. DE invests heavily in battery design, where it has a two-year lead on the competition in terms of higher efficiency and lower dependence on rare elements. It leverages its battery expertise across all of its activities.

1.9 Non-Financial Engagement – Energetix Power

Caerus consultants have prepared the following overview of the energy industry and its primary risks.

Energy Utility Industry Overview

Energy Utilities in the U.S. generally operate as geographic monopolies that operate under the oversight of state utility commissions in retail markets and the Federal Energy Regulatory Commission (FERC) in wholesale markets. They are required to make substantial investments in the generation, distribution and transmission of electricity and natural gas during normal periods, peak periods and natural disasters. State Utility Commissions are required to ensure each utility is profitable, over time, in the retail sector, but no such profitability requirement exists for the wholesale side.

Key Risks

Strategic Risks

- Demand risks
    - Decline in customer demand or increasing customer demand for green energy
    - Inability to meet the growing demand for energy
- Disruptive technologies (e.g., techniques to extract oil from nonconventional sources) could change the balance of energy supply and demand
- Climate risk

Regulatory, Legislative, and Legal risks

- Revenues, earnings, and the ability to recover costs are impacted by:
    - Legislation and regulation affecting utility operations
    - The rates that state utility commissions allow utilities to charge
- Deregulation or restructuring in the electric industry may result in increased competition
- Environmental laws and regulations related to global climate change may require significant capital expenditures

Operational risks

- Ability to provide energy and the cost to provide it may be affected by:
    - Natural disasters
    - Operational accidents
    - Terrorist activities, military activity or other government actions
- The reputation and financial condition of utilities could be impacted by:
    - Cyberattacks and data security breaches
    - Construction projects that are started and cancelled prior to completion
    - Consumer dissatisfaction over power outages

Market/price risk

- Financial results may be affected by:
  - The overall market, economic conditions, and fluctuations in commodity prices
  - Extreme weather conditions (including those associated with climate change)

Company Overview

Energetix Power Company ("Energetix") is an energy company headquartered in Denver, Colorado. It is a holding company doing business in seven states in the western United States through business segments. The three main operating business segments are:

- Electric Utilities and Infrastructure
- Gas Utilities and Infrastructure
- Commercial Renewables

Energetix has about 25,000 employees. About 25% of the employees are represented by labor unions under various collective bargaining agreements.

The CFO of Energetix recently attended an industry conference and found the session on Enterprise Risk Management (ERM) in the energy industry particularly interesting. She jotted down some thoughts for developing a comprehensive ERM function at Energetix.

- It is important to understand the nature of the risks in the energy industry and the specific, unique or biggest risks in our company. We should have a risk register.
- What is our philosophy of risk? How can we characterize our risk appetite?
- If we have a vision for ERM, it will help spread the message throughout the company.

  Draft ERM Vision:

  Effective risk management is of primary importance to the success of Energetix. We will develop a comprehensive risk management process to monitor, evaluate and manage the principal risks we assume in conducting our activities.
- How could we reflect the external views from regulators, rating agencies, other stakeholders in our ERM implementation?
- Where should we start? Should we target one division first and then roll out to the rest of the company? We will need an ERM governance model.
- How to quantify / analyze the risks?
  - Which risks measures and techniques should be applied for quantifiable risks?
  - How to analyze the non-quantifiable risks such as operational risks
  - What is the best way to get data to measure potential losses? 1) using historical data (e.g., the 2011 nuclear disaster in Japan) for stress testing, 2) surveying our inhouse experts and getting their opinions for scenario testing or any other approaches.
- Which tools, techniques and strategies could be applied for our risk management?

    - Which hedging instruments / strategies could we apply for financial risks (e.g., pricing risk)?
    - Which approaches (e.g., transfer the risks via insurance contract) could we apply further for other risks such as operational / strategic risks?
- Maybe we should consider engaging Caerus to help us get started with this process.

Electric Utilities and Infrastructure (EUI)

EUI operates in retail and wholesale electricity markets.

a. In the retail market, its businesses operate as the sole supplier of electricity within their service areas. EUI owns and operates facilities necessary to generate, transmit and distribute electricity. Services are priced by state approved rates designed to include the costs of providing these services and a reasonable return on invested capital.

   Competition in the regulated electric distribution business is primarily from the development and deployment of alternative energy sources, such as private on-site solar.

b. In the wholesale market, Energetix competes with other utilities for bulk power sales, sales to municipalities and cooperatives and wholesale transactions under cost-based contracts approved by the Federal Energy Regulatory Commission (FERC). The principal factors in competing for these sales are price, availability of capacity, and reliability of service. Prices are influenced primarily by market conditions and fuel costs.

Energy requirements in excess of a utility's own capacity are supplied through contracts with other generators of electricity and purchased on the open market. Factors that could cause EUI to purchase power for its customers may include generating plant outages, extreme weather conditions, demand growth, and price. The EUI companies complete projections under various scenarios to test what actions would be needed if one or more counterparties failed to provide the contractual amount of energy.

EUI owns the power wires used to transmit electricity to its customers. Several of the EUI subsidiaries have considered making extensive upgrades to their lines and the equipment used to support them. However, these companies have delayed doing any maintenance because the wiring is located in difficult-to-reach wooded areas and because the regulator-approved rates have not allowed for a focus on maintenance.

EUI's generation portfolio is a balanced mix of energy resources having different operating characteristics and fuel sources, designed to provide energy at the lowest possible cost to meet its obligation to serve retail customers. All options, including owned generation resources and purchased power opportunities are evaluated every three to five years to select the lowest-cost resources available to meet system load requirements.

Last year, the state regulator for one of the EUI companies mandated that, within the next 20 years, 50% of all electricity in that state must be generated from renewable resources such as wind or solar energy. Energetix is working on identifying the current and projected renewable energy providers, the amounts of renewable energy that they will be able to provide, and whether the EUI subsidiary can meet the mandate. It is expected that other EUI companies will have to meet similar requirements at some point in the future.

EUI relies principally on coal, nuclear fuel, and natural gas for its generation of electricity.

Gas Utilities and Infrastructure (GUI)

GUI conducts natural gas operations through regulated public utilities in five states. GUI serves residential, commercial, industrial and power generation natural gas customers.

The number of residential, commercial, and industrial customers within the GUI service territory is expected to increase over time. Average usage per residential customer is expected to remain flat or decline for the foreseeable future. GUI also owns, operates, and has investments in various pipeline transmission and natural gas storage facilities.

GUI is responsible for the distribution of natural gas to retail customers in its service territories. Its natural gas procurement strategy is to contract primarily with major and independent producers and marketers for natural gas supply. It also purchases a diverse portfolio of transportation and storage service from interstate pipelines. This allows GUI to assure reliable natural gas supply and transportation for its customers during peak winter conditions.

Commercial Renewables (CR)

CR primarily acquires, builds, develops, and operates wind and solar renewable power generation throughout the continental United States. Revenues are generated by selling the power produced from renewable generation through long-term contracts to utilities, electric cooperatives, municipalities and commercial and industrial customers. In most instances, these customers have obligations under state-mandated renewable energy standards or similar state or local renewable energy goals.

As part of its growth strategy, CR has expanded its investment portfolio through the addition of distributed solar companies and projects, energy storage systems and energy management solutions specifically tailored to commercial businesses.

CR is subject to regulation at the federal level.

The market price of commodities and services, along with the quality and reliability of services provided, drive competition in the wholesale energy business. CR's main competitors include other nonregulated generators and wholesale power providers.

Pension Plan

Energetix sponsors traditional defined benefit pension plans for all employees. Following are the abbreviated 2022/2023 financial results for Energetix, including select results for the pension plans:

1/1/2023 Balance Sheet	(in 000s)
Company Assets	140,000
Pension Assets	50,000
Total Assets	190,000
Company Liabilities	80,000
Pension Liabilities	80,000
Total Debt	160,000
Equity	30,000

Other 2022 Financial Information	(in 000s)
Pretax Income	1,100
Components of Pension Expense	
Service Cost	2,000
Interest Cost	2,994
Expected Return on Assets	(3,500)
(Gain)/Loss Amortization	(440)
Prior Service Cost Amortization	550
Pension Contribution	2,660
Actual Pension Return	1,770

2022 Cash Flows	(in 000s)
Operating Cash Flow	880
Financing Cash Flow	990

2023 Assumptions	
Pension Liability Discount Rate	3.75%
PBGC Variable Rate Premium (as a % of unfunded liabilities)	3.00%

1.10 Non-Financial Engagement – SeaLux Cruise Lines

Global Cruise Industry Overview

Cruises offer a broad range of products to suit vacationing guests of many ages, backgrounds and interests. Cruise brands can be broadly classified as offering contemporary (short, casual cruises), premium (7 to 14 days, higher quality, destination-focused), and luxury (very high standards of accommodation and service, exotic itineraries) experiences.

Industry Key Risks

- World events impacting the ability or desire of people to travel
- Weather conditions, natural disasters, or other incidents affecting cruise ships and/or passengers
- Technology risks, including breaches in data security, disruptions to information technology operations, and failure to keep pace with developments in technology
- Ability to recruit, develop and retain qualified shipboard personnel
- Increases in fuel prices, changes in the types of fuel consumed, and availability of fuel supply

Company Overview

SeaLux Cruise Lines is a publicly traded leisure travel company in the cruise and vacation industries, headquartered in Seattle, Washington. SeaLux is active in all categories of cruises, ranging from family-friendly and budget-conscious up to prestigious high-priced cruises to exclusive port cities.

SeaLux is a leading provider of vacations to all major cruise destinations throughout the world.

With operations in North America, Australia, Europe and Asia, the company sells tailored cruise products, services and vacation experiences on 92 ships to the world's most desirable locations.

SeaLux believes there are large, addressable markets with low penetration rates in numerous countries where it is already an established presence. It particularly sees Asia as a market with large potential, where economic growth has raised discretionary income levels, fueling an increasing demand for travel.

Strategy

Major goals for the company over the next five years include:

1) Development of two new vacation destinations in the Caribbean
2) Adding six new ships to the fleet -- three of the ships are additions to the fleet (i.e., the ship count will increase from 92 to 95), and the other three will replace existing ships
3) Increasing marketing efforts in Asian countries, especially China, which will require increasing awareness of cruises as a vacation alternative

Potential Caerus Engagements

- Due to the COVID-19 pandemic, SeaLux ceased operations world-wide for 12 months but began limited operations again in 2021. It wants to determine what actions to take to ensure its survival during the ongoing pandemic.

- SeaLux wants to understand the impact of COVID-19 on its strategy to penetrate the Chinese market.
- SeaLux is concerned about political risk and the impact it could have on global operations.
- SeaLux wants to consider alternatives to petroleum-based fuels for operating its ships. It believes this could provide an opportunity for more cost-efficient operation of its fleet, and also will enhance the company's reputation as an environmentally-friendly company.

1.11 Financial Engagement – Lyon Corporation

Company Overview

Lyon Corporation is a financial services holding company. It is described in detail in the remaining sections of the case study and therefore the background on the company is not repeated here.

Engagements with Caerus

Over the past ten years Lyon has established a beneficial relationship with Caerus and continues to hire Caerus for periodic consulting engagements. Some previous engagements have focused on the following areas:

- Evaluation of potential and actual acquisitions, including specifically Helios
- Advice in the area of board composition and governance
- Education in the development and uses of economic capital models

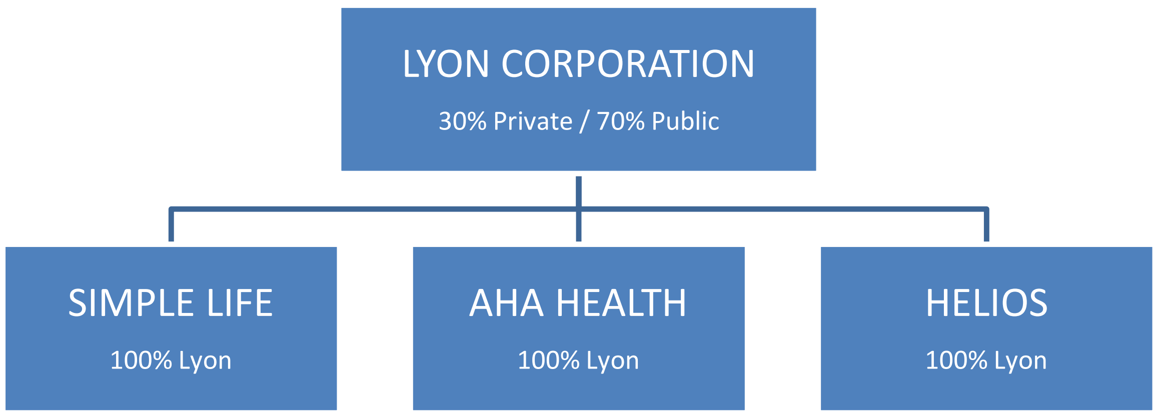
2 Lyon Corporation

2.1 Overview

Lyon Corporation is a diversified U.S. public holding company with interests in financial services companies.

2.2 Structure

Lyon Corporation is a Massachusetts public company (LCC: NYE and TSX) with a significant shareholder, Lyon Family, which owns about 30% of the outstanding shares. The holding company has the following structure:



Percentages denote equity interest and voting rights.

2.3 Simple Life

The Simple Life Insurance Company (SLIC) is a U.S. life insurance company located in Boston, Massachusetts, wholly owned by Lyon Corporation, selling throughout the U.S. SLIC has four lines of business: Universal Life (UL); Level Premium Term Insurance with three available level term periods: 10, 20 and 30 year; Single Premium Immediate Annuities (SPIA); and Variable Annuities with a Return of Premium (ROP) Guaranteed Minimum Death Benefit (GMDB) and an optional Guaranteed Minimum Accumulation Benefit (GMAB) or Guaranteed Minimum Withdrawal Benefit (GWAB). SLIC issues its products only in the United States.

2.4 AHA Health

AHA Health Insurance Company (AHA) is a national insurer located in California with its home office in Los Angeles. AHA is wholly owned by Lyon Corporation. AHA sells individual and group health insurance.

2.5 Helios

Helios Life is located in Triangle City, Atlantis, a jurisdiction that uses the Euro as its currency. It is 100% owned by Lyon Corporation. Helios offers life insurance, disability insurance, and a combination illness/disability/life insurance product.

Helios was acquired by Lyon Corporation in 2020. It was hoped that Helios would be a strategic entry into more global markets though Lyon has not as yet devoted much time to developing Helios.

To date, Helios has provided steady profits. Helios reports earning on an IFRS basis. Earnings are translated to a U.S. GAAP dollar basis for reporting Lyon's consolidated financial statements. Lyon has allowed earnings to be retained within Helios to date but is now considering taking a dividend from Helios to provide Lyon with additional financial flexibility.

2.6 Lyon Board of Directors

The Lyon Board consists of twelve members, four of whom directly or indirectly represent the Lyon family interest. One of these four, R. Tomas Lyon III, also serves as the Board Chairman of SLIC. There are seven outside board members, five of whom are Chief Executive Officers or Board Chairmen in leading public companies in the United States or Canada. The other board member is the Board Chairman of AHA Health.

Mandate of the Board

The mandate of the Board, which it discharges directly or through one of the five Board Committees, is to supervise the management of the business and affairs of the Corporation. Responsibilities include approval of strategic goals and objectives, review of operations, disclosure and communication policies, oversight of financial reporting and other internal controls, corporate governance, Director orientation and education, senior management compensation and oversight, and Director nomination, compensation, and assessment.

Board Committees

Executive Committee

The Executive Committee has and may exercise all or any of the powers vested in and exercisable by the Board, except approval of the annual strategic plan.

Audit Committee

The primary mandate of the Audit Committee is to provide to the Board an independent review of the procedures, controls, and results of the financial statements of the Corporation and public disclosure documents containing financial information.

Compensation Committee

The primary mandate of the Compensation Committee is to approve compensation policies and guidelines for employees of the Corporation, to approve compensation arrangements for executives and Directors of the Corporation, and to oversee the management of incentive compensation plans.

Related Party and Conduct Review Committee

The primary mandate of the Related Party and Conduct Review Committee is to review and recommend approval of proposed transactions with related parties of the Corporation.

Governance and Nominating Committee

The primary mandate of the Governance and Nominating Committee is to oversee the Corporation's approach to governance issues, to assess the effectiveness of the Board of Directors, the Board's Committees, and the Directors, and to recommend to the Board candidates for election as Directors and for appointment to Board Committees.

Code of Conduct and Business Ethics

The Board of Directors has adopted a Code of Business Conduct and Ethics to promote and maintain a culture of integrity throughout the Corporation. The Code is applicable to Directors, officers and employees of the Corporation.

Board Minutes

The Board is involved with the management of Lyon at both a strategic and an operational level. Excerpts from the March 12, 2023 Board meeting are provided here.

1. NEW BUSINESS
    a. Development of Corporate Risk Committee

       The Board Risk Subgroup presented a proposal to establish a Corporate Risk Committee.

       Proposed Membership:

       - Promote the CRO of Helios to head this Committee based on his risk experience in Helios and his charismatic style
       - Bring over two actuaries from AHA's ERM group to join the committee
       - Hire two actuarial students from the outside

       Proposed Responsibilities:

       The Corporate Risk Committee will meet regularly with the Lyon subsidiaries to discuss the risk oversight process within each subsidiary. This will alleviate the need for the Board to get involved with details such as metrics that are best understood by the subsidiaries.

       A couple of questions were asked regarding the salaries of the individuals, but the proposal passed with one of the outside directors dissenting.

b. Corporate Audit Head

The Audit Committee announced that they had recently approved the hire of John Marmot, to be appointed as Head of the Corporate Audit team, reporting to the chair of the Audit Committee. John and his team will review financial statements, develop a risk management framework, and make sure that we all follow the ERM framework that we established for Lyon and subsidiaries, in alignment with our strategic objectives.

c. Review of Current Sales and Potential New Products

Bob Seoul, VP of Operations for AHA Health, reported that AHA is meeting its sales target levels for all current businesses, and his department is now in development of a new Critical Illness product.

A question was asked about the viability of a Critical Illness product given that at least three competitors have stopped selling this type of product. Seoul responded that his staff was still validating their market analysis but felt that the exit of the other companies from this market would only help AHA's proposed sales.

There was a lot of discussion, and a motion was made to stop the development of the Critical Illness product. The motion was seconded and passed by a 5 to 3 vote.

d. Review of Potential "quick sale" Acquisition

R. Tomas Lyon III reported that he has been approached about a potential acquisition. Tyger Corporation is looking to exit the annuity market and wants to sell its wholly owned subsidiary CUB Annuity. Because this would be a quick sale, it is being handled outside the company's normal acquisition protocols. CUB Annuity provided financials for the past three years. The data has not been independently validated by an auditor, but Mr. Lyon stated that he knows the CFO of Tyger Corporation very well and would feel comfortable trusting their numbers.

There was extensive discussion, but, since a decision needed to be made prior to the next board meeting, the board decided to vote. The board agreed to sign a letter of commitment for the acquisition by a 4 to 4 vote, with R. Tomas Lyon III having the deciding vote when there is a tie.

2.7 Credit Rating

Lyon and its subsidiaries are rated by Kelly Rating Agency, an internationally recognized rating agency. Lyon Corporation has a financial strength rating of A (Super) from Kelly Ratings for the insurance group. The rating reflects the sufficient capital position of SLIC and Lyon's overall positive financial results. Lyon's debt rating is BBB. The individual insurance companies, SLIC and AHA Health, strive to maintain AA Kelly ratings.

2.8 Oversight of Lyon Companies

Lyon Corporation, SLIC, and AHA Health are each managed by an executive team (comprising the CEO, CFO, and COO and four to six other executives). Each CEO reports directly to his respective board. SLIC and AHA Health each have an independent Board of Directors.

2.9 Lyon Acquisition Activity

Lyon has grown from a simple life insurance company to a multi-line, multi-national insurer through acquisition. It continues to seek out appropriate acquisitions as a means of growth.

Following are potential acquisition targets that Lyon is considering:

1) Single Premium Deferred Annuity (SPDA) writer that has a strong sales-oriented culture

2) Larger block of Single Premium Immediate Annuity (SPIA) business to manage in combination with its small existing block

3) Reinsurer, to allow for both expansion to a new market and the offering of reinsurance solutions to existing subsidiaries

4) Writer of institutional insurance / asset management business

5) Canadian company to increase its presence internationally with moderate risk

6) European insurer to develop a presence in one of the largest insurance markets

Information for three of the potential acquisitions has been gathered for review:

Target 1: SPDA Writer

AnnCo is a single-line U.S. company, which sells only fixed SPDAs. The product that is currently being sold is a multi-year guaranteed annuity with 5, 7, or 10-year interest rate guarantees, based on current interest rates, and a market value adjustment (MVA) on withdrawal before the end of the guarantee period. After the guarantee period there is an underlying minimum guarantee rate of 0.25%. It has been noted that most annuitants lapse at the end of the initial interest rate guarantee period.

Reserves for the current product total about $1 billion. The investment portfolio supporting the product is somewhat aggressive in order to support competitive rate guarantees. It includes a mix of private equity, asset-backed securities, and high-yield bonds, along with traditional fixed income securities.

AnnCo also has a legacy block of SPDAs with $400 million in reserves. These legacy SPDAs were sold in the 1990s, with high minimum guaranteed interest rates for the life of the policy. In the current low interest rate environment, all policies are being credited at the guaranteed rate. This block has not met its original profit objectives. These annuities have been in force long enough that there are no remaining surrender charges; therefore, the account value is available for withdrawal without a market value adjustment at any time.

AnnCo's culture emphasizes sales over any other objectives. The SPDAs are sold through independent agents and other financial advisors. Sales have grown by 10% per year for the past three years.

Lyon's life insurance subsidiary, SLIC, is considering two options for acquiring AnnCo:

(1) Acquiring only the $400 million legacy block
(2) Acquiring the entire company

SLIC is currently pricing the transaction to return 10% on invested capital.

Target 2: SPIA Writer

This block of business is being sold because the current company wants to get out of the market. In recent years the company has faced a significant amount of competition and was able to increase sales in 2022 only by changing its investment strategy in order to obtain a higher yield.

SPIA	**2018**	**2019**	**2020**	**2021**	**2022**
Statutory Income Statement (000s)					
Premiums & Policy Fees	80,888	82,829	28,266	43,398	88,830
Ceded Premiums					
Net Investment Income	50,584	56,894	59,897	63,338	66,784
Total Revenue	**131,472**	**139,723**	**88,163**	**106,736**	**155,614**
Surrender & Annuity Benefits	54,288	58,648	63,029	67,424	71,820
Death Benefits	-	-	-	-	-
Ceded Benefits	-	-	-	-	-
Increase in Net Reserves	55,130	54,803	27,238	27,077	53,845
Expenses	20,934	25,452	30,121	34,945	39,928
Net Transfers to/(from) Separate Account	-	-	-	-	-
Total Benefits & Expenses	**130,352**	**138,902**	**120,388**	**129,447**	**165,593**
Income Before Income Tax	1,120	821	(32,225)	(22,711)	(9,979)
Federal Income Tax	392	287	(11,279)	(4,769)	(2,096)
Net Income	**728**	**534**	**(20,946)**	**(17,941)**	**(7,884)**
Statutory Balance Sheet (000s)					
General account assets	807,736	865,322	903,527	945,389	998,383
Separate account assets	-	-	-	-	-
Total Assets	**807,736**	**865,322**	**903,527**	**945,389**	**998,383**
Net General Account Reserve Liabilities	768,755	823,462	859,757	899,526	949,870
Separate Account Liabilities	-	-	-	-	-
Total Liabilities	**768,755**	**823,462**	**859,757**	**899,526**	**949,870**
Surplus	**38,981**	**41,860**	**43,770**	**45,863**	**48,513**
Total Liabilities and Surplus	**807,736**	**865,322**	**903,527**	**945,389**	**998,383**
Economic Capital Balance Sheet (000s)					
Market Value of Assets	**1,021,673**	**1,097,889**	**1,149,890**	**1,206,852**	**1,278,398**
Economic Reserve	983,236	1,056,502	1,106,508	1,161,287	1,230,082
Required Economic Capital	38,437	41,387	43,382	45,565	48,317
Free Surplus	-	-	-	-	-
Total Liabilities and Surplus	**1,021,673**	**1,097,889**	**1,149,890**	**1,206,852**	**1,278,398**

Target 3: Reinsurer

MPS Re is a reinsurer based in California, USA. It has been in business for 20 years, reinsuring Personal Property, Personal Auto and Construction Insurance.

The aggregate financials for MPS Re are below.

MPS Re	**2018**	**2019**	**2020**	**2021**	**2022**
Statutory Income Statement (000s)					
Underwriting Income					
Premiums earned	1,189,105	951,288	858,269	884,023	910,543
Losses and loss adjustment expenses incurred	801,288	1,300,000	619,454	639,538	660,224
Expenses	**369,942**	**294,771**	**261,286**	**269,123**	**277,199**
Net Underwriting Gain (loss)	**17,875**	**(643,483)**	**(22,471)**	**(24,638)**	**(26,880)**
Investment Income	**81,508**	**68,075**	**56,821**	**55,804**	**57,481**
Income Before Income Tax	**99,383**	**(575,407)**	**34,350**	**31,166**	**30,601**
Federal Income Tax	**34,784**	**(201,393)**	**12,023**	**6,545**	**6,426**
Net Income	**64,599**	**(374,015)**	**22,328**	**24,621**	**24,175**
Statutory Balance Sheet (000s)					
Total Assets	**2,799,951**	**2,009,647**	**2,006,101**	**2,103,384**	**2,203,738**
Losses and loss adjustment expenses	785,262	1,209,300	619,454	639,538	660,224
Unearned Premium	528,493	422,795	435,480	448,543	462,001
Other Liabilities	300,184	237,610	248,223	255,671	263,339
Total Liabilities	**1,613,940**	**1,869,705**	**1,303,158**	**1,343,752**	**1,385,564**
Surplus	**1,186,011**	**139,943**	**702,943**	**759,633**	**818,174**
Total Liabilities and Surplus	**2,799,951**	**2,009,647**	**2,006,101**	**2,103,384**	**2,203,738**
Economic Capital Balance Sheet (000s)					
Market Value of Assets	**3,007,090**	**2,163,329**	**2,165,032**	**2,275,459**	**2,389,721**
Economic Reserve	1,801,085	1,525,198	1,457,343	1,506,641	1,557,584
Required Economic Capital	270,163	228,780	218,601	225,996	233,638
Free Surplus	935,842	409,351	489,088	542,822	598,499
Total Liabilities and Surplus	**3,007,090**	**2,163,329**	**2,165,032**	**2,275,459**	**2,389,721**

2.10 Financials

The current year financial statements are provided for Lyon Corporation on a consolidated basis.

Lyon Consolidated 2022 Statements

2022 FINANCIAL STATEMENTS	SLIC	AHA	Helios	Lyon Corporate *	Combined Financials
Income Statement (000s)					
Premiums & Policy Fees	952,071	6,088,018	166,675	0	7,206,764
Investment Income	286,769	47,819	89,947	13,610	438,145
TOTAL REVENUE	**1,238,840**	**6,135,837**	**256,622**	**13,610**	**7,644,909**
Life, accident and health benefits	535,268	4,944,283	114,655	0	5,594,206
Other expenses	591,813	905,131	118,026	5,281	1,620,251
TOTAL EXPENSES	**1,127,081**	**5,849,414**	**232,681**	**5,281**	**7,214,457**
Income Before Income Tax	111,759	286,423	23,941	8,329	430,452
Income Tax	31,293	80,198	5,253	2,249	118,993
Net Income	80,466	206,225	18,688	6,080	311,459
Balance Sheet (000s)					
General account assets	4,786,693	2,701,088	1,581,999	285,430	9,355,210
Separate account assets	1,776,396	0	0	0	1,776,396
Total Assets	**6,563,089**	**2,701,088**	**1,581,999**	**285,430**	**11,131,606**
Separate account liabilities	1,776,396	0	0	0	1,776,396
Future policy benefits and claims, other liabilities	4,241,142	1,016,699	1,397,199	0	6,655,040
Other liabilities	0	0	0	52,235	52,235
Total Liabilities	**6,017,538**	**1,016,699**	**1,397,199**	**52,235**	**8,483,671**
Surplus	**545,551**	**1,684,389**	**184,799**	**233,194**	**2,647,933**
RBC Ratio	4	7			
Total Liabilities and Surplus	**6,563,089**	**2,701,088**	**1,581,999**	**285,430**	**11,131,606**
Additional Balance Sheet Information					
Dividend/Capital Transfer from/(to) Lyon	(44,592)	0	0	44,592	0
Economic Capital					
Required Economic Capital	435,048	1,783,122	170,109	23,691	2,411,970
Excess Capital	109,900	192,407	63,810	218,365	584,482
Available Economic Capital	**544,948**	**1,975,529**	**233,919**	**242,056**	**2,996,452**

* Excluding investments in subsidiaries

** RBC Ratio reduced by any dividend to Lyon paid in following year

Note: SLIC uses Company Action Level RBC; AHA uses Authorized Control Level RBC

2.11 ORSA

Lyon completes an annual ORSA report, as required by various regulatory authorities. The process for the development of the ORSA involves the following:

- Lyon has a dedicated team whose primary responsibility is completing the ORSA report.
- The team is divided into sub-units, each of which focuses on one of the subsidiaries – SLIC, AHA, and Helios. The material used from each subsidiary is based on the processes that the subsidiary already has in place, in order to reduce the amount of additional work required.
- A separate section of the ORSA report is prepared for each subsidiary.
- The consolidated report is submitted to the Board as part of its reading package for the March Board meeting.

The Executive Summary of the most recent report follows:

"Lyon Corporation has carried out an assessment of all of the risks that it believes can materially affect its business. Lyon has determined its capital requirements based on its current business plan to be $2.412 billion as of December 31, 2022. This assessment has been overseen by the Board throughout the process.

"The ORSA process has considered the firm's strategy and business model in light of its business plans, risk tolerances and capital requirements. No immediate changes are proposed in those areas, although several areas for consideration were identified.

"The ORSA process requires that we consider the effectiveness of our risk assessment, risk management, and capital management processes within the firm. Several enhancements are currently in process of implementation including the introduction of a Corporate Risk Committee and a Corporate Risk Appetite statement.

"This report which follows is a summary of important results from the ORSA.

Excerpt from the Capital Assessment section of Lyon's ORSA Report:

Lyon determines its capital requirements based on the economic capital process that is already in place within its subsidiary companies.

- *SLIC has an internal economic capital model tailored to its own company-specific risks. Risks are quantified based on a one-year 99.0% VaR measure. The model quantifies exposure to interest rate risk, equity price risk, and credit risk.*
- *AHA uses an internal economic capital model calibrated to an AA financial strength based on Kelly ratings, which is considered equivalent to a one-year 99.0% confidence interval.*
- *Helios provides economic capital results based on the requirements of its jurisdiction, Atlantis.*

The ORSA capital requirement for Lyon is equal to the sum of the economic capital requirements reported by the subsidiaries plus a credit risk factor applied to the Lyon Corporate assets.

Excerpts from the Risk Assessment section of Lyon's ORSA Report:

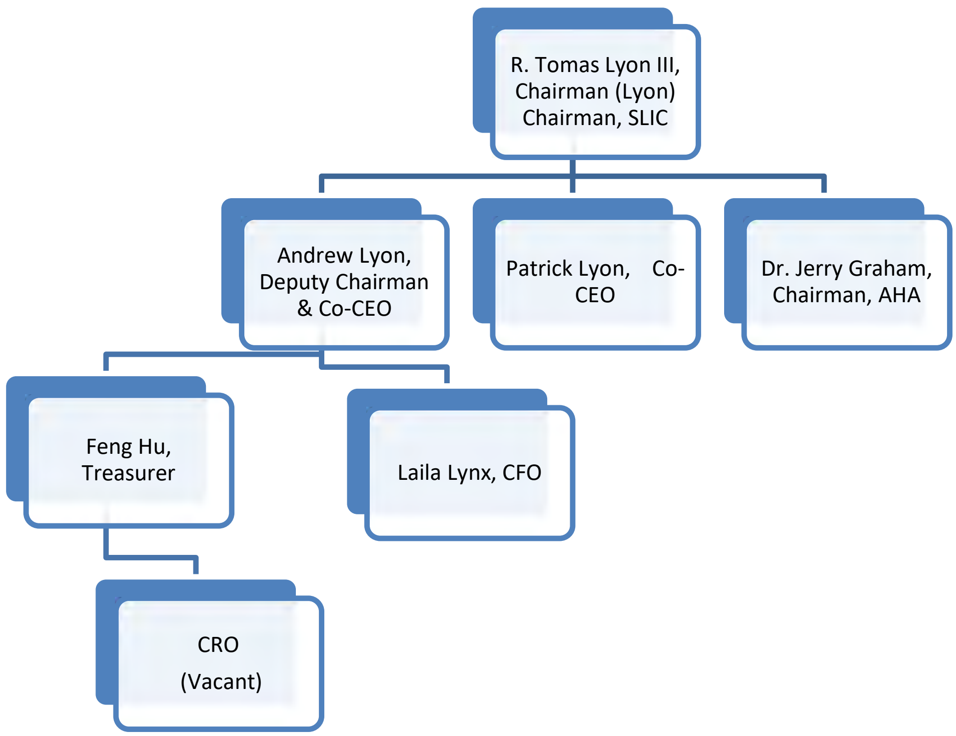
"The acceptance of risk is the primary responsibility of the subsidiary. Risk is first identified, measured and managed at the subsidiary entity level. Diversification across risk types is calculated at the subsidiary level. Risk aggregation to the corporate level is the sum of all subsidiary-level risks by risk category. Lyon Corporation is in process of establishing a risk appetite statement with the intent of constraining specific aggregate risks within acceptable ranges."

"Risks of a less quantifiable nature are currently addressed on an ad hoc basis within each subsidiary's risk management program but are not reflected in their reported economic capital. For instance, while all the subsidiaries recognize that reputational risks arise at both the corporate and subsidiary levels, they believe the impacts to their respective businesses vary significantly. Thus, one subsidiary may only address the risk through risk management processes and controls, while another may explicitly try to estimate it and report it within operational risk economic capital."

3 Lyon Corporation (Corporate) Functions and Oversight

Lyon Corporation functions as a holding company with three fully owned subsidiaries: Simple Life Insurance Company (SLIC), AHA Health Insurance Company (AHA), and Helios Insurance Company. Lyon Corporation is publicly owned, with 30% of the shares held by the Lyon family. The company has $50 million in debt outstanding in the form of 20-year bonds issued in 2006 at 7.75% interest and uses an after-tax cost of capital of 10% to determine the value of an acquisition or a project.

A simplified organization chart for Lyon follows:



Lyon Corporation is in the process of developing a corporate level ERM function. Operational information provided to Corporate from the primary affiliated companies (SLIC and AHA) has been limited up until this time. However, the ERM department recently asked each affiliate to provide a summary description of its company, including product lines, outside relationships, risk assessments and concerns, and current business issues.

Lyon requires its U.S. subsidiaries to dividend excess capital up to the holding company. In turn, Lyon will consider providing capital contributions to subsidiaries that fall short of their capital requirements.

The documents in this section of the case study comprise various reports, e-mails, and memos related to the operation of Lyon Corporation.

The first set of reports that follow represent the first submissions from SLIC and AHA in response to Corporate's request for summary descriptions of each company.

3.1 SLIC Report to Corporate

Company Summary

The Simple Life Insurance Company (SLIC) is 100% owned by Lyon Corporation. R. Tomas Lyon III serves as Chairman of the Board, President and CEO.

SLIC is a life insurance company with four lines of business: Term Life, Universal Life (UL), Single Premium Immediate Annuities (SPIAs), and Variable Annuities (VAs).

Capitalization and Investments

The company strives to maintain a strong statutory risk-based capital (RBC) ratio, targeting capital at 350% of Company Action Level RBC, and to have an available to required economic capital ratio of 110% or greater. Any surplus in excess of the larger of 400% of Company Action Level RBC and 110% of required economic capital is distributed to Lyon Corporation through a dividend paid in cash annually at the end of the first quarter based on the year-end balance sheet. Surplus positions less than the larger of 300% of Company Action Level RBC and 90% of required economic capital are addressed through a capital contribution from Lyon Corporation.

The company's general account is invested primarily in fixed-income assets. Variable annuity (VA) fixed accounts, which are minimal, are part of the general account; VA separate account investments are held in a segregated account and are managed by a third-party investment advisor.

Within the general account, there are separate investment portfolios for each of the four main product lines.

Portfolio Summary

The following is a breakdown by asset class of the market value of SLIC's general account investment portfolios ($ million) as of 12/31/2022, excluding derivatives and variable annuity separate (segregated) accounts.

	US Govt	US Corporate Investment Grade Public	US Corporate Investment Grade Private	US Corp Below Inv Grade	US CMBS/ ABS	Mortgages	Real Estate	Common Stock	Cash & Short-Term	Other	Total
Total	175	1,631	550	120	986	950	9	4	225	100	4,872

The "Other" investment class includes foreign sovereign debt, private equity, and other assets outside the traditional categories.

Risk Policies

Credit Risk: Fixed-income securities in the general account have exposure limits at individual obligor (issuer) and sector levels. For each portfolio, there are weighted average credit quality targets.

Market Risk: The company measures the effective duration of the assets and liabilities, semi-annually within the term, UL and SPIA lines of business. If the asset and liability durations are further apart than 0.5, the asset portfolio is rebalanced within 30 days such that its new effective duration equals that of the liabilities.

For the term, UL, and SPIA lines of business, any non-U.S. dollar fixed income positions are currency-hedged back to U.S. dollars using currency derivatives.

VA hedging is done on an economic basis. The hedging uses a dynamic approach updated monthly for market factors and quarterly for liability inforce changes. The key risk measures are delta and rho, and the program updates its equity and interest rate derivatives such that at least 80% of liability delta and rho are hedged. This “opportunistic” hedging methodology allows the hedging team to take some bets, as long as these hedging targets are met.

Liquidity Risk: The liquidity policy requires SLIC to hold sufficient liquid assets to meet expected demands for cash in a unique liquidity stress-test scenario. The scenario focuses on a reputational liquidity crisis, where markets continue to operate normally and the liquidity crunch affects only the company. The liquidity stress test anticipates situations where the company’s ability to sell assets to meet cash needs from its liability products is hindered by the market taking advantage of the company during the crisis. In addition, testing periodically considers a systemic stress scenario where the entire market is not able to sell assets at a reasonable value. However, SLIC’s liquidity policy does not require it to hold sufficient liquid assets to be able to meet cash demands in such a scenario, since it expects regulatory relief in a systemic crisis.

Operational Risk: The SLIC Chief Risk Officer will be responsible for collecting and disseminating risk information. A report will be prepared monthly and distributed to executive management.

Last year SLIC completed a review of the back-office operations of its investment department. There were several goals it wanted to fulfill with this review:

- Assure completion of trades on a timely and accurate basis
- Maintain compliance with governmental regulations.
- Ensure adequate procedures and staffing in light of the COVID-19 global pandemic

One result of the review was the recognition that the asset administrative system was outdated. This led to the purchase and installation of the Asset Valuation and Accounting (AVA) system, a new computer system to value assets and maintain records of all trades. The system was purchased partly on the basis of its stated ability to reconcile all trades without human intervention once the information is entered into the system. This automation will allow SLIC to devote more money to maintaining competitive salaries for its investment analysts. AVA was installed in less time than the vendor had claimed was needed, allowing SLIC to save money on consulting and installation fees it would have otherwise paid to the vendor. SLIC was also impressed with AVA's ability to automatically handle the accounting of all asset trades and update daily asset values.

In the course of installing AVA, SLIC implemented a review of all procedures related to asset transactions initiated by the Investment Department. The review was beneficial because it showed that the department had been handling certain trading and recordkeeping functions the same way for the past 40 years. After instituting efficiency improvements, the Investment Department was able to reduce operations staff by five people (20 percent).

SLIC Risk Management Committee

The committee meets on a quarterly basis. Meetings focus on reviewing internal risk reports and interviews with key employees in finance, systems, and audit.

The committee recently recommended the hiring of a Chief Risk Officer (CRO), who will create and lead an independent Enterprise Risk Management (ERM) department. The CRO will be responsible for developing and implementing a comprehensive company-wide ERM program and serve as the risk liaison across various business segments to address significant emerging concerns.

The Board has determined that the Risk Management Committee will be redundant once the CRO is in place and has sufficient experience. Thus, the Risk Management Committee will be disbanded on the date the CRO becomes an officer of SLIC.

Initial Product Report

The Company distributes its products through an independent brokerage system. The Company supplies marketing materials and product descriptions. Brokers are responsible for their own training.

Level Premium Term Insurance

Product Description: The term life insurance line has two series of products. The fully underwritten line, Secure Term, offers three term periods: 10, 20 and 30 years. The simplified issue line, Simple Term, offers a 10-year level term product. Both lines are renewable after the level term period on a steeply increasing annual premium scale and are convertible to the currently issued UL product during the level term period.

For both term insurance lines, SLIC makes use of reinsurance, the terms of which have been fairly consistent for many product generations. The fully underwritten line is coinsured at 60% to Trust Us Re, and any single life issue over $1 million is 100% reinsured with the same reinsurer. The simplified issue line is reinsured under YRT treaties to a pool of four reinsurers, each with an 8% quota share.

Based on the emerging experience results and increasing face amounts for more recent issues of these products, SLIC is re-evaluating its reinsurance agreements and retention limits.

Market Position: Sales have been strong, due to competitive pricing, higher-than-average first year sales compensation, and a strong advertising campaign.

Experience: The fully underwritten line has shown improving mortality relative to pricing and lower-than-priced lapse rates. In contrast, the simplified issue line shows deteriorating mortality relative to pricing and higher-than-priced lapse rates.

The SLIC Pricing department has implemented cutting edge approaches to assess mortality experience, including performing predictive modeling exercises to better understand sensitivity to various independent variables (e.g., policy duration, insured's socio-economic status, state of issue, etc.). In addition, SLIC participates in and uses Society of Actuaries (SOA) industry studies to assess its relative experience. The SOA studies span the last five years of mortality incidence and are refreshed annually. Pricing systematically distributes the experience study report to other modeling areas, so their assumptions can be kept current.

A recent study of the term conversion experience has shown a sharp increase in utilization of the conversion privilege and poor mortality experience on the conversions.

SLIC's current annual lapse experience studies are based on the last five years of experience but are being refined. Currently, studies exist for aggregate experience by issue age and policy year, but enhancements are planned to include splits for gender and underwriting risk class.

Proposed New Product: SLIC is considering introducing an Accelerated Underwriting (AUW) term product.

Variable Annuity

Product Description: All Variable Annuity contracts provide a Return of Premium (ROP) GMDB. Partial withdrawals are permitted, with the GMDB reduced dollar for dollar by the amount of the withdrawal. The VA offers a collection of eight proprietary mutual fund choices (seven domestic and one foreign) and a fixed fund invested in the general account.

Two optional Guaranteed Living Benefits (GLBs) are offered as riders, only one of which may be chosen for a single underlying contract: (i) a Guaranteed Minimum Accumulation Benefit (GMAB), which guarantees the contractholder's account value will not drop below the premium deposit (reduced by any withdrawals) as of the 10th year anniversary; or (ii) a Guaranteed Minimum Withdrawal Benefit (GMWB) that guarantees the contractholder the ability to withdraw 5% of the benefit base per year for life, regardless of whether the account value is sufficient to support these withdrawals. The benefit base equals net deposits rolled up at 5% per year until the contractholder starts to take withdrawals. The annual fee for this rider is 1% of the benefit base.

The most recent sales mix, as measured by account value, shows 30% without a GLB, 20% with a GMAB and 50% with a GMWB.

Experience:

All SLIC VA modeling applications use industry mortality experience as published by a large actuarial consulting firm seven years ago. Other assumptions (e.g., surrenders or GMWB utilization) are those used by the Pricing department.

Universal Life

Product Description: When SLIC began selling Universal Life in 2004, the company sold a mix of various UL products, with 4% guarantees, which were common at that time. Some of those products are still in force.

The company's current universal life offerings consist of two different products:

The Saver Supreme product is designed to accumulate high cash surrender values relative to the death benefit over time and guarantees its investment performance at 3% per year. The Protector Plus product is designed for the consumer who wants death benefit protection at the lowest possible premium; it guarantees that the policy will stay in force if the specified premium is paid each year.

SLIC currently supports these products with investment grade corporate bonds and U.S. Treasuries, targeting a 2% spread.

Current Issues: The administrative system needs additional programming to handle some product features that are now available to the policyholder. To date these features selections have been tracked manually through electronic notes in the policy file.

The company is behind its competitors in handling admin processes for the UL product. Other companies have either made the difficult decision to invest in new systems or, in some cases, have entered into relationships with administrative services companies.

Experience:

SLIC has not yet implemented a separate mortality study for its UL product. Instead, SLIC bases its UL mortality assumption for all modeling applications on the Secure Term mortality experience studies, since both products have the same risk class structure and underwriting criteria.

SLIC's lapse study on the UL product is fairly comprehensive, reflecting the surrender charge period and the dynamic impacts of crediting rates. It includes the last five years of lapse experience and is updated semi-annually by Pricing, which then systematically distributes these reports to all other modeling groups.

The UL product is not currently reinsured.

Single Premium Immediate Annuity

Product Description: The SPIA product is available as a straight life-only annuity (75% of portfolio by reserve) and as a period certain annuity, with annuitant-specified certain periods up to 20 years. Neither product version has a death benefit.

Experience: Recent mortality studies have shown mortality about equal to what was expected in pricing. However, mortality seems to be improving faster than expected.

SLIC's pricing mortality assumption is based on Pricing's annual experience study spanning the last two years of experience. Pricing makes this study available to the other modeling groups upon request. The mortality improvement assumption for all modeling applications is based on industry experience as released in a study performed by a large consulting firm two years ago. A more recent study received a few weeks ago showed an uptick in mortality improvement at older ages, which SLIC has not yet reflected in pricing.

Market Position and Investment Strategy: The product is selling well, but decreasing interest rates are a matter of concern. Traditionally, assets supporting this block have been investments in high quality long term corporate bonds and treasuries. However, in response to the recent economic environment and the uptick in mortality improvement, higher yielding investments have been considered to help meet the desired profit margin. These potential new investments include such assets as real estate, domestic private equity and emerging markets common equity.

3.2 AHA Report to Corporate

Note to File with respect to AHA's report, from Jean Manx, Lyon Risk Manager:

Because Lyon management has little experience with health insurance, the company has been content to allow the AHA management a great deal of autonomy. AHA feels this arrangement has continued to work well and AHA objected to any additional oversight by Corporate. AHA was reluctant to provide a very thorough report to Lyon – so the report that follows is abbreviated.

Company Summary

AHA Health Insurance Company (AHA) is a national insurance company located in California with its home office in Los Angeles. AHA is wholly owned by Lyon Corporation.

Management / Culture

AHA management tends to be aggressive and willing to take risks. The company does not have a named CRO and is more focused on sales than risk.

AHA's management team has a generous incentive plan. The incentive compensation plan criteria include sales, membership growth, and quality of care. AHA's plan covers management staff from top management to frontline management. The goal is to have all management focused on the key drivers of success.

AHA is also implementing a set of contingent compensation agreements for its brokers.

Products

AHA sells individual, small group, and large group health insurance in California and 14 other states. Products are sold primarily by brokers, who maintain a relationship with AHA.

AHA's health insurance policies include comprehensive major medical coverage of hospital services, physician services, and prescription drugs. In addition, the group policies may include dental coverage. Dental is offered as an additional benefit attached to the medical policies.

Provider Networks & Medical Management

AHA has staff that negotiates with physician and monitors hospital providers in each state in which it is licensed. One of its largest providers is NCHS, a community health system located in northern California. AHA also has contracts with three national vendors:

- Networks 'R Us provider networks when members need services outside of states in which AHA is licensed
- Carefree Rx, a nationwide drug plan, to manage and administer its prescription drug coverage
- Painless Dental to manage and administer its dental plans.

AHA's centralized medical management staff administers its medical management policies consistently in all states in which it is licensed. AHA's staff continually reviews and revises these policies to keep costs down and to keep up with the latest developments. Its three national vendors work with AHA to make sure their medical management policies do not conflict with those of AHA.

Operations

AHA has a claims system developed and maintained by a well-respected national vendor. AHA maintains a close relationship with this vendor to make sure that the system meets all of its needs. AHA's claim department has experienced turnover due to the recent pandemic, resulting in lower staff levels than desired and more inexperienced and untrained staff.

AHA uses credibility rating to underwrite large group business coverage. While the underwriting decision is systematically determined in most cases, Jose Gambas, the Senior Pricing Actuary, makes the ultimate underwriting decision for the largest cases, relying on his extensive experience in the industry.

AHA captures claims experience at a granular level, allowing for quick updates to pricing, repricing, and forecasting assumptions based on the regular monitoring of active claims. In addition, the data are used for research, ad hoc financial analyses, group reporting, and financial reporting. In fact, the group reports have proved helpful in showing groups how to lower their costs.

Risk Management

AHA has never had a CRO. The company has a risk committee with limited scope and authority that reacts to emerging risk as necessary, and different senior managers take on a CRO role as needed.

The risk committee issues reports as deemed necessary to affected Departments. Risks are managed in silos, relying on the expertise within each Department.

AHA currently targets holding capital at 600% of Authorized Control Level RBC (300% of Company Action Level RBC). Surplus in excess of 700% of Authorized Control Level RBC (350% of Company Action Level RBC) is distributed annually to Lyon Corporation through a dividend paid in cash at the end of the first quarter based on the year-end balance sheet. Surplus positions less than 500% of Authorized Control Level RBC (250% of Company Action Level RBC) are considered deficient and result in a request for a capital contribution from Lyon Corporation.

Acquisitions

AHA management is open to acquisition opportunities and is currently looking into one of two possible acquisition targets.

The primary target for purchase is Eureka Insurance Company (Eureka), a health insurance company domiciled in New York. The driving force behind this acquisition would be to help AHA enter a new market without needing to build a lot of infrastructure. Initially, Eureka management would remain in place to run the company and integration would proceed over several years. AHA management is putting together a due diligence team including staff from AHA finance, actuarial, marketing, and medical management.

Alternatively, AHA is considering the purchase of Columbia, a New York LTC insurer. Columbia is active in most U.S. states.

3.3 Corporate Financial Statements

Memorandum to Lyon Senior Management

Date: February 27, 2023

Subject: Corporate Financial Statements

Please find below the Corporation’s financial statements, as recently completed for year-end 2022.

The current year financial statements are provided for Lyon Corporation on a consolidated basis, and multi-year summary statements are provided for each of the subsidiaries. In the subsidiary statements, 2021 and 2022 are actual results; 2023–2025 are projections.

Lyon Consolidated 2022 Statements

2022 FINANCIAL STATEMENTS	SLIC	AHA	Helios	Lyon Corporate *	Combined Financials
Income Statement (000s)					
Premiums & Policy Fees	952,071	6,088,018	166,675	0	7,206,764
Investment Income	286,769	47,819	89,947	13,610	438,145
TOTAL REVENUE	**1,238,840**	**6,135,837**	**256,622**	**13,610**	**7,644,909**
Life, accident and health benefits	535,268	4,944,283	114,655	0	5,594,206
Other expenses	591,813	905,131	118,026	5,281	1,620,251
TOTAL EXPENSES	**1,127,081**	**5,849,414**	**232,681**	**5,281**	**7,214,457**
Income Before Income Tax	111,759	286,423	23,941	8,329	430,452
Income Tax	31,293	80,198	5,253	2,249	118,993
Net Income	80,466	206,225	18,688	6,080	311,459
Balance Sheet (000s)					
General account assets	4,786,693	2,701,088	1,581,999	285,430	9,355,210
Separate account assets	1,776,396	0	0	0	1,776,396
Total Assets	**6,563,089**	**2,701,088**	**1,581,999**	**285,430**	**11,131,606**
Separate account liabilities	1,776,396	0	0	0	1,776,396
Future policy benefits and claims, other liabilities	4,241,142	1,016,699	1,397,199	0	6,655,040
Other liabilities	0	0	0	52,235	52,235
Total Liabilities	**6,017,538**	**1,016,699**	**1,397,199**	**52,235**	**8,483,671**
Surplus	**545,551**	**1,684,389**	**184,799**	**233,194**	**2,647,933**
RBC Ratio	4	7			
Total Liabilities and Surplus	**6,563,089**	**2,701,088**	**1,581,999**	**285,430**	**11,131,606**
Additional Balance Sheet Information					
Dividend/Capital Transfer from/(to) Lyon	(44,592)	0	0	44,592	0
Economic Capital					
Required Economic Capital	435,048	1,783,122	170,109	23,691	2,411,970
Excess Capital	109,900	192,407	63,810	218,365	584,482
Available Economic Capital	**544,948**	**1,975,529**	**233,919**	**242,056**	**2,996,452**

* Excluding investments in subsidiaries

** RBC Ratio reduced by any dividend to Lyon paid in following year

Note: SLIC uses Company Action Level RBC; AHA uses Authorized Control Level RBC

SLIC Financial Statements

	2021	2022	2023	2024	2025
Statutory Income Statement (000s)					
Premiums & Policy Fees	1,410,009	1,519,039	1,643,355	1,782,693	1,938,875
Ceded Premiums	(516,395)	(566,968)	(624,848)	(691,301)	(767,773)
Net Investment Income	266,495	286,769	313,857	343,438	378,009
Total Revenue	**1,160,109**	**1,238,840**	**1,332,364**	**1,434,830**	**1,549,111**
Surrender & Annuity Benefits	121,968	135,447	147,960	162,258	176,378
Death Benefits	683,210	750,731	816,057	898,535	993,694
Ceded Benefits	(312,639)	(350,910)	(382,219)	(424,317)	(473,625)
Increase in Net Reserves	284,430	313,519	342,613	369,302	397,208
Expenses	164,273	176,877	190,375	205,852	223,592
Net Transfers to/(from) Separate Account	117,154	101,417	92,708	83,097	72,489
Total Benefits & Expenses	**1,058,396**	**1,127,081**	**1,207,494**	**1,294,727**	**1,389,736**
Income Before Income Tax	101,713	111,759	124,870	140,103	159,375
Federal Income Tax	28,480	31,293	34,964	39,229	44,625
Net Income	**73,233**	**80,466**	**89,906**	**100,874**	**114,750**
Statutory Balance Sheet (000s)					
General account assets	4,437,301	4,786,693	5,152,817	5,570,397	6,010,523
Separate account assets	1,376,883	1,776,396	2,035,331	2,306,969	2,591,399
Total Assets	**5,814,184**	**6,563,089**	**7,188,148**	**7,877,366**	**8,601,922**
Net General Account Reserve Liabilities	3,927,624	4,241,142	4,583,755	4,953,059	5,350,266
Separate Account Liabilities	1,376,883	1,776,396	2,035,331	2,306,969	2,591,399
Total Liabilities	**5,304,507**	**6,017,538**	**6,619,086**	**7,260,028**	**7,941,665**
Surplus	**509,677**	**545,551**	**569,062**	**617,338**	**660,257**
RBC Ratio	407%	402%	407%	400%	400%
Total Liabilities and Surplus	**5,814,184**	**6,563,089**	**7,188,148**	**7,877,366**	**8,601,922**
Additional Balance Sheet Information					
Dividend/Capital Transfer (to)/from Lyon	(33,037)	(44,592)	(66,395)	(52,598)	(71,832)
Economic Capital Balance Sheet (000s)					
Market Value of Assets	**6,058,380**	**6,858,428**	**7,497,238**	**8,231,847**	**8,989,008**
Economic Reserve	5,553,124	6,313,480	6,934,729	7,589,921	8,284,220
Required Economic Capital	418,785	435,048	463,556	498,855	536,755
Excess Capital	86,471	109,900	98,953	143,071	168,033
Total Liabilities and Surplus	**6,058,380**	**6,858,428**	**7,497,238**	**8,231,847**	**8,989,008**

* RBC Ratio reduced by any dividend to Lyon paid in following year

AHA Financial Statements

TOTAL	2021	2022	2023	2024	2025
Statutory Income Statement (000s)					
Earned Premiums	5,609,546	6,088,018	6,700,167	7,286,846	7,800,484
Health benefits	4,592,204	4,944,283	5,465,872	5,916,158	6,306,235
General expenses	837,639	905,131	930,035	856,684	877,985
Total Expenses	**5,429,843**	**5,849,414**	**6,395,907**	**6,772,842**	**7,184,220**
Investment Income	**38,828**	**47,819**	**53,240**	**60,327**	**70,409**
Income Before Income Tax	**218,531**	**286,423**	**357,500**	**574,331**	**686,673**
Federal Income Tax	**61,189**	**80,198**	**100,100**	**160,813**	**192,268**
Net Income	**157,342**	**206,225**	**257,400**	**413,518**	**494,405**
Statutory Balance Sheet (000s)					
Total Assets	**2,406,544**	**2,701,088**	**3,060,717**	**3,572,211**	**3,965,992**
Liability for unpaid claims and claim adjustment expenses	603,026	669,682	737,018	801,553	858,053
Other Liabilities	325,353	347,017	381,910	415,350	444,627
Total Liabilities	**928,379**	**1,016,699**	**1,118,928**	**1,216,903**	**1,302,680**
Surplus	**1,478,165**	**1,684,389**	**1,941,789**	**2,355,308**	**2,663,312**
RBC Ratio	630%	659%	688%	700%	700%
Total Liabilities and Surplus	**2,406,544**	**2,701,088**	**3,060,717**	**3,572,211**	**3,965,992**
Additional Balance Sheet Information					
Surplus Transfer from/(to) Corporate	0	0	0	0	0
Dividend/Capital Transfer (to)/from Lyon	0	0	0	0	(186,400)
Economic Capital Balance Sheet (000s)					
Market Value of Assets	**2,942,390**	**3,298,258**	**3,734,914**	**4,335,540**	**4,803,399**
Economic Reserve	1,204,041	1,322,730	1,460,379	1,592,967	1,710,671
Required Economic Capital	1,566,596	1,783,122	2,056,236	2,483,677	2,805,128
Excess Capital	171,754	192,407	218,300	258,897	287,599
Total Liabilities and Surplus	**2,942,391**	**3,298,259**	**3,734,915**	**4,335,541**	**4,803,398**

* RBC Ratio reduced by any dividend to Lyon paid in following year

3.4 Rating Agency Report

Lyon Corporation is preparing for a financial strength rating review by Kelly Rating Agency, an internationally recognized rating agency. Kelly has previously focused on its ratings of stand-alone insurance companies, such as SLIC and AHA, but beginning last year required that insurance groups be rated in aggregate for the group. During its review last year, Kelly identified several issues that it expects Lyon to address before the next review, scheduled for later this year. Correspondence related to the prior review and Kelly's most recent rating report are provided starting on the following page.

Kelly Ratings & Analysis - When it comes to ratings, clearly you need Kelly

1 Kelly Drive, Capital City ph 123/555-6500

February 10, 2023
R. Tomas Lyon III
Lyon Corporation

Dear Mr. Lyon:

It is time once again for Kelly Ratings & Analysis' annual review of Lyon Corporation. I will call you next week to set up a date. Ideally, Paula Silver, Director of our Financial Services Practice, and I would like to meet with Lyon Corporation sometime in early April. As in past years, we will come to your offices for a day of meetings with your senior management team. Count on the presentation from Lyon Corporation taking the first half of the meeting; the second half will be a free form Q&A with your management. We can finalize the agenda during next week's call.

Attached is Kelly's rating rationale from last year. Due to last year being the initial group-level review and the lack of available group financial data, the rationale was based primarily on our qualitative assessment of the group and its component companies. Please look through this document and make note of any aspects that you wish to discuss. In addition, we will need your 2022 financial information. I would like to receive that in advance of our meeting.

I want to remind you: since last year was the first year for a group-level rating review, our Kelly Financial Wherewithal Rating™ (commonly known as the "Kelly Rating") was not publicly disclosed. It was intended to help you understand our group assessment criteria and how Lyon Corporation would be evaluated, so you would have an opportunity to improve any deficient processes before this year's public rating. The financial strength rating determined for Lyon Corporation last year was **A**.

Evaluating implementation and effectiveness of insurers' ERM processes has become an increasingly important part of Kelly's evaluation and rating of insurer's financial strength. During this year's annual review, we would also like to start having more discussions with Lyon Corporation management on several aspects related to the risk management processes, such as ERM culture and policies, risk governance, risk control and mitigation processes, strategic risk management, as well as management of specific risks (e.g., ALM, credit risk, liquidity risk, operational risk, business continuity).

Sincerely,

Otto Gold
Director, Financial Services Rating Bureau

LYON CORPORATION

2021 Kelly Financial Wherewithal Rating^{TM} - Group Level

Based on our opinion of the company's financial strength, it is assigned a **Kelly Financial Wherewithal Rating^{TM} of A**(Super). The company's Financial Size Category is Class VIII.

Rating Rationale

Rating Rationale: The financial strength rating for Lyon Corporation reflects the company's strong capital position, reasonable operating performance and the long-term stability of its management. However, profitability has not been as strong as its rating peers, and Lyon Corporation will continue to face challenges as a public company.

Rating History

No history – Initial Group Rating

Business Review

Lyon Corporation began operations in 1908. For most of its history, it has been controlled by the Lyon family. R. Tomas Lyon III is its fourth-generation leader.

Lyon Corporation began as a life insurance company selling innovative term life insurance at very aggressive rates. That continues to be a hallmark of the company today.

The company began to broaden its scope in the 1990's by offering public stock. The Lyon Family originally maintained a majority ownership of the company but has subsequently divested a substantial portion of its shares. The Lyon Corporation is now 30% privately held by the Lyon Family. A holding company structure was put in place. The original life insurance company became Simple Life (SLIC), owned 100% by Lyon Corporation. The Corporation also acquired a health insurance company, AHA Health, early in 2005. Lyon Corporation became an international group in 2020 with the acquisition of Atlantis-based Helios Insurance Company. All of the subsidiaries are owned 100% by Lyon Corporation.

SLIC has significantly increased its product offerings beyond term insurance and now has a growing SPIA line of business, as well as universal life and variable annuities. However, all of the SLIC products face competitive pressures and likely will require updated features and pricing.

AHA has provided solid results and takes a proactive approach to the health market.

Helios has shown steady profitability and has provided a reasonable means for Lyon Corporation to gain international experience on a small scale.

Investment operations have not performed especially well on a risk-adjusted basis and there is some concern if the low interest rate environment persists.

After several years of sluggish growth, Lyon Corporation has set some very aggressive growth targets for the future. The company appears to have the capital to fund this growth internally; however, the plan to actually achieve sales at these levels remains unclear.

Earnings

Lyon Corporation's earnings have benefited over the years from solid product profitability in most lines of business. We expect product earnings to decline in the future as the company attempts to grow its business in a very competitive market. The current low interest rate environment will also continue to put pressure on earnings.

Profitability Analysis
(in millions of dollars)

Net Op Gain	2018	2019	2020	2021
SLIC	44.8	62.8	67.7	75.5
AHA	165.9	155.9	54.4	157.6
Other	12.2	13.8	14.0	14.2
Total	222.9	232.5	136.1	247.3

* Net Op Gain excludes non-business-related impacts in Net Income, such as realized capital gains and losses.

Capitalization

Capital and surplus within the subsidiaries are quite strong, totaling $2.4 billion. It appears that the company's excess capital could be deployed more effectively to increase earnings and returns for shareholders. The company's growth strategy may be a means to accomplish this, if implemented appropriately.

However, we note that Lyon Corporation has not made any significant efforts to measure capital requirements on a risk-adjusted basis. Therefore, it is difficult for Lyon Corporation to evaluate the appropriateness of its growth strategy or other potential strategic initiatives. We believe that this needs to be a future focus for corporate management if Lyon Corporation wishes to demonstrate that it is being run effectively.

We also note that the company continues to operate with minimal long-term debt. While this capital structure can be appropriate for a corporation, in our opinion, Lyon Corporation has not done any evaluation to justify that this is the best structure for the company.

Investments and Liquidity

Lyon Corporation maintains a conservative investment portfolio, based primarily on high-quality investment grade corporates and Treasuries. As a result, default experience in the fixed income portfolio has been very good and can be viewed as much better than insurance industry averages over the most recent years. The portfolio has also provided sufficient liquidity.

We understand that Lyon Corporation is exploring the possibility of moving to more aggressive portfolios for select lines of business by adding high yield and BBB-rated debt securities, as well as equities. This is an area that Kelly will continue to monitor.

Officers

Chairman (Lyon Corporation); Chairman and CEO (SLIC) -- R. Tomas Lyon III
Deputy Chairman of the Board, Co-CEO (Lyon Corporation) – Andrew Lyon
Co-CEO (Lyon Corporation) – Patrick Lyon
Chairman and CEO (AHA Health) – Dr. Jerry Graham

3.5 Corporate ERM Department

Memorandum: To All Lyon and Affiliate Executive Staff
From: Patrick Lyon, Co-CEO
Subject: Corporate ERM Department

We are pleased to announce the creation of the new Corporate ERM Department. This action is being taken in recognition of increased rating agency focus on ERM and regulatory expectations for a formal ERM process. The appointment of a Chief Risk Officer (CRO) is expected shortly.

The Corporate ERM Department will be housed within the Treasurer's Division, and the new CRO will report to Feng Hu, Treasurer. The CRO will have access to staff from Treasury operations, on an "as needed" basis.

The objectives of the Corporate ERM Department are:

- Establish a consistent ERM process among the Lyon Corporation companies
- Promote a strong risk culture within Lyon Corporation
- Develop a corporate-level Economic Capital modeling process
- Create a risk appetite statement and assess overall risk exposure in relation to risk appetite
- Develop a strategic risk profile in conjunction with the Corporate Strategic Planning Department

As part of the development of our ERM function, it is important that we convey an appropriate risk culture to all of our staff and affiliates. Lyon Corporation defines risk culture as the norms of behavior for employees in Corporate and the affiliates to accept or take risks within the prescribed risk limits, and the ability to identify, understand, discuss and act on the risk at the Corporate as well as affiliate levels. Once the ERM processes are fully established, Lyon Corporation expects that all employees will fully understand the ERM processes and have the conviction to openly discuss risk issues with their managers. Until the CRO is appointed, Internal Audit will take a large role in developing the program.

Several status reports are attached to bring all of you up to speed on the ERM-related activities that are already underway. Tomas, Andrew, and I expect your complete cooperation and support for this new initiative.

Economic Capital Modeling

The three affiliated companies have provided information on the status of economic capital modeling within their organizations. The statutory and economic balance sheets for each affiliate are independent of each other. The assets assigned to a line of business on an economic basis may not be the same as the assets assigned on the statutory basis.

SLIC

SLIC has implemented an internal economic capital model tailored to its own company-specific risks. The intent is to quantify the risks to the company's net equity (on a market-consistent basis) using a one-year 99.0% Value at Risk (VaR) measure. The model quantifies exposure to interest rate risk, equity price risk, and credit risk. The model targets a total economic capital level that is calibrated to an AA financial strength based on Kelly ratings.

Stochastic scenario testing is supplemented with deterministic scenario-based stress tests, performed annually. Each test is applied as an instantaneous shock to the economic conditions as of the valuation date. Interest rates have a floor of 0.10%. Interest rates are modeled stochastically using a single-factor model calibrated to monthly historical data for 10-year U.S. Treasury yields since 2002. Equity returns are modeled stochastically using a regime-switching lognormal distribution that is calibrated to thirty years of daily S&P 500 equity index returns.

For term, UL, and SPIA products, a traditional actuarial approach is used to estimate the economic reserves and revalue them under different interest rate scenarios in the VaR calculation.

For the VA and its GMAB and GMWB, the VaR is calculated with liabilities net of hedging assets and derivatives. Implied volatility is derived from current exchange-traded 10-year at-the-money equity puts. As an approximation, the test assumes expiring derivatives can be replaced with current at-the-money instruments.

For credit risk, the model assumes that existing investment grade fixed income assets are sold immediately if they fall below investment grade. Therefore, the company does not quantify the risk of credit default or loss given default. Credit risk is modeled through the stochastic simulation of credit ratings migration. The calibration uses ten years of historical data for corporate bond ratings migrations and yield spreads. Since the company has a general buy and hold investment strategy, credit spreads are only considered to be a risk factor if and when investment grade assets are downgraded below investment grade. SLIC calculates the risk of fluctuations in market value due to credit spread movements in the absence of ratings downgrades but excludes the results since its statutory surplus is based upon asset book value and it has a general buy and hold investment strategy.

For each insurance risk (e.g., mortality, longevity, lapse):

- The economic balance sheet is recalculated using the stressed assumption (with the other risks at the baseline assumptions)

- The required economic capital for that risk equals the decrease in economic surplus as a result of that stress

At this point, the Company does not have an operational risk model and, therefore, operational risk is estimated to be 10% of the fair value of liabilities, whose calculation excludes any provisions for this risk.

Procedurally, the economic capital for each risk is calculated for each line of business; these values are then aggregated for that line of business using a correlation matrix derived from the prior ten years of market movements. All negative correlations are floored at zero. Operational risks are assumed to have zero correlation with other factors. The economic capital for each product line is then summed to get SLIC's total economic capital.

AHA

AHA uses an internal economic capital model. The model targets a total economic capital level that is calibrated to an AA financial strength based on Kelly ratings. AHA defines the model economic capital required as being the capital required to protect AHA's policyholders in order to meet all of their claims with a confidence level of 99.0 percent over a one-year time horizon.

AHA invests in liquid, highly rated bonds with asset/liability matching to support their health liabilities. Their investment returns are sufficient to support their pricing.

AHA Memoranda – Economic Capital

Note To: *Andrew Lyon, Co-CEO*
Laila Lynx, CFO, Lyon
From: *Neisha Kampango, CFO, AHA*
Date: *August 20, 2022*

Andrew and Laila,

I know you have been concerned about the lack of information forthcoming on AHA's economic capital modeling. As evidence that we are taking this issue seriously, please see a copy of the following internal AHA memos. I have responded to Adele Pike that she should proceed as indicated in her August 15 memo below.

Best regards,
Neisha

Date: July 20, 2022

Subject: Economic Capital Modeling
To: Adele Pike, Valuation Actuary
From: Neisha Kampango, CFO

I'm starting to get pressure from Lyon Corporate to provide them with a more robust description of how we are developing our internal EC model. Ultimately, I think we will need to complete a major overhaul of our EC process.

I would like you to start with the group lines of business and see what we can do to improve the forecasting that is part of the EC. That should be a good first step.

Please have a report for me within the next month.

Date: August 15, 2022

Subject: Economic Capital Modeling for Small and Large Group
To: Neisha Kampango, CFO
From: Adele Pike, Valuation Actuary

We’re still working on your project to refresh our required EC forecast, but I wanted to give you an update on our Small and Large Group benefit forecast assumptions leading to the required EC determination.

As you know, forecasting benefits has always been a challenge for us given the unpredictable medical benefits inflation rate. Thus, for simplicity, we’ve decided to keep our forecast of the expected benefits amount based on a deteriorating loss ratio that reflects our recent historical trend. Similarly, the underlying premium forecast is based on the recent historical growth rate, with some miscellaneous adjustments (e.g., reflects expected key group wins and losses to the extent known).

From this quantity, we can then calculate required capital (i.e., 99% confidence level) using the benefits statistical distribution from the past few years’ worth of data.

Please let me know your thoughts on our approach.

Strategic Risk Analysis

Risk Appetite

In the absence of a CRO, the Lyon Audit Committee has commenced work on developing a risk appetite statement for Lyon Corporation.

Risk Appetite Statement (Draft)

Lyon recognizes that it will take on certain business risks in an informed and proactive manner, such that the level of risk is aligned with its strategic business objectives. Lyon’s most important strategic objectives include:

- Maintaining a stable dividend on its stock, which is dependent upon consistent dividends from its subsidiaries
- Maintaining financial flexibility, which is dependent on being able to issue debt at a reasonable cost
- Maintaining positive brand recognition and its current reputation as a responsible corporate citizen

Using these strategic objectives, as well as industry norms, the committee has drafted the following risk appetite statement components:

Insurance Risk - Lyon cannot suffer more than a $400 million increase in required Economic Capital for a 1-in-200-year event due to insurance risk.

Liquidity Risk – Lyon needs to maintain a liquidity level to meet payment requirements for a 1-in-200-year event for a continuing period of three months.

Market Risk - Lyon cannot suffer more than a 10% decrease in economic available capital due to market risk for a 1-in-200-year event.

Lyon's risk management process is designed to facilitate management's regular review of current risk exposures against Lyon's risk appetite. Any risk with the potential to have a material impact on shareholder value will be included within the scope of the risk management process. The Board will, on a regular basis, review and approve Lyon's risk appetite.

AHA Data Breach – E-mail Correspondence

Date: October 24, 2022

To: Patrick Lyon, Co-CEO
From: Niesha Kampango, CFO, AHA

Patrick,

I felt I should make you aware of a potential problem that's just come up at AHA. I'm forwarding a copy of the note I just sent to Bob Seoul. I'll certainly keep you informed of the steps we're taking to address this.

Sincerely,

Niesha

Date: October 24, 2022

Subject: Customer Data Integrity
To: Bob Seoul, VP Operations, AHA
From: Niesha Kampango, CFO, AHA

Bob,

I'm extremely concerned about the data breach that occurred this week in our individual health line customer data base. You're aware that there are both serious financial implications for AHA and sensitive public relations issues as a result.

Your team needs to get on top of this right away –

- What was the cause of this breach?
- How was the problem found?
- What do we need to do at this point to address the immediate problems resulting from the breach?
- How do we mitigate the risk of this situation occurring again in the future?

I'd like to meet on Wednesday to discuss the first item and to see your plans for responding to the second.

Cybersecurity

In light of recent highly publicized information security breaches, the Lyon Board has mandated the Corporate ERM Department to implement a cybersecurity program. This initiative is a top priority for senior management, and they have been keen to extend their strong risk management culture to encompass information security as well. As Lyon is constrained with respect to resources and capabilities in the cybersecurity space, Lyon has retained the services of a well-known security software vendor, DataShield, to establish an effective cybersecurity framework. DataShield's report is provided below.

From: Megan Argus, CEO of DataShield
To: Lyon Corporate ERM Department

Date: April 1, 2023

DataShield has completed a review of Lyon's information security vulnerabilities at all the subsidiaries, and we have developed a customized cybersecurity solution to meet your needs. The implementation of your cybersecurity framework is complete.

The scope of our software includes all subsidiary servers and personal computers. We have encrypted all these devices and established a permissions-based access protocol which is administered by the IT departments. It is our understanding that these departments are responsible for cybersecurity at Lyon. Additionally, we provide external monitoring of these devices and immediately notify your cybersecurity designate of potential breaches.

We are also providing the ERM department with the appropriate cyber risk assessment tools to integrate with your broader ERM processes. These assessment tools will allow you to produce heat maps of known cyber threats to Lyon and the subsidiaries.

We believe these steps should protect you against any foreseeable cybersecurity threat.

We expect that our cybersecurity platform is 100% effective for your company, and we look forward to protecting your organization's sensitive information.

Business Continuity Planning – E-mail Correspondence

To: R. Tomas Lyon, Chairman
From: Patrick Lyon, Co-CEO

Date: May 25, 2023

Tomas,

You asked me to deal with the request from Kelly Ratings for a copy of our Business Continuity Plan.

As I think you're aware, Lyon Corporation doesn't have a complete plan that covers all of our subsidiaries. But I talked with Ted Gato in our IT department to see what they have in place. He said that they have nightly backups of all our electronic data, so if something happened to our system, they could get our data restored without losing more than one day of work. We've also contracted recently with DataShield to protect us against cybersecurity attacks.

I'm including with this note a memo from Ted that provides more details.

In summary, I think we're in pretty good shape! We'll just write something up for Kelly Ratings.

Patrick

Forwarding e-mail from Lyon IT Department

To: Patrick Lyon, Co-CEO
From: Ted Gato, Head of IT

Date: May 20, 2023

The IT department has a disaster recovery plan in place that addresses technical recovery actions to be taken in the event of a significant disruption.

Our recovery plan addresses damage (physical or electronic) to the following areas:

- Computer room environment – includes routers, firewalls, network switches, cabling panels, servers, and network storage
- Office hardware – desktops, laptops, peripherals, and printers
- Connectivity – to external service providers for internet and communication systems
- Software applications – business systems, email, and office productivity
- Database systems – supporting business systems and reporting functions

We maintain a systems inventory of both software and hardware for all departments and employees to facilitate the recovery process.

In the event of wide-spread damage to the corporate office's physical space, we have space available to us at SLIC's offices across town. We have enough extra desktop computers stored there for use by key employees to continue our core operations for a brief period of time, as well as a handful of laptops we could provide. Obviously, there isn't enough space or equipment for all of our employees there, but it is enough for one or two from each department.

SLIC Accelerated Underwriting – E-mail Correspondence

Date: November 15, 2022

To: Laila Lynx, CFO
From: Henri Jay, EVP

Laila,

FYI – thought you would be interested in hearing about the accelerated underwriting product we are looking into at SLIC. It's amazing how much information is out there about each of us.

Henri

From: William Xu, SVP
To: Henri Jay, EVP

Date: November 15, 2022

Henri,

I was thinking about adding an Accelerated Underwriting (AUW) term product to our term product line-up. AUW appeals to many potential clients by making it easier for folks in good health and with strong credit to obtain term life insurance, without having to go through the hassle of invasive UW techniques or the delays in receiving doctor statements and medical tests. AUW is a very popular product in the industry right now.

We can leverage our simplified issue (SI) underwriting infrastructure and obtain the data needed (for example, credit scores, driving record, and so on) to determine if the AUW policy can be issued, or if a fully underwritten (FUW) application is required, or if the application needs to be rejected.

I expect our underwriting system to be robust, and as such, do not expect to have to limit the death benefit requested. However, to be safe, we may want to find a reinsurance partner to cover the excess of our desired retention level.

I'd appreciate your thoughts on this approach.

Sincerely,

William

Correspondence related to SPIA Investment Strategy:

Date: April 1, 2022

Subject: SPIA Investment Strategy
To: Henri Jay, EVP
From: Louise Condor, VP - SPIA

The sustained low interest rate environment has been a challenge for my SPIA product line's profitability. The product is selling well, but changing interest rates are a matter of concern. Traditionally, this block has been supported by fixed income assets. However, in response to the recent economic environment and the uptick in mortality improvement, I'm considering supporting this block's reserves with higher yielding investments to help meet our desired profit margin. These potential new investments include such assets as real estate, domestic private equity and emerging markets common equity. I expect this investment strategy change to also give us a leg up on our competition, and significantly increase sales.

Operational Risk Measurement Refinement Initiative – E-mail Correspondence

Date: March 26, 2023

To: Laila Lynx, CFO
From: Pierre LeGrouse, CFO SLIC

Laila,

FYI – interesting developments in how to model operation risk in SLIC's economic capital model.

Pierre

Date: March 25, 2023

To: Pierre LeGrouse, CFO
From: Jamal Robinson, VP and Actuary – Operational Risk Management
Subject: Op Risk Measurement Refinement

I have started a project to investigate holding operational risk economic capital calculated based on first principles, instead of our current approach of holding 10% of the fair value of liabilities. I feel that our current approach leads to an overly conservative amount that can be justifiably reduced with a more accurate calculation.

That means we need to be able to model both frequency and severity for potential operational risk events. I suggest that we start by developing capital calculation methodologies for the following common operational risk events before expanding the analysis more broadly.

1) Theft of policyholder information by a hacker
2) IT Systems failure for one day or longer
3) Internal fraud
4) Office shutdown due to weather-related event
5) Model Risk (specifically, modeling errors)

To develop our models, I think we can use SLIC internal data in conjunction with financial services industry studies, as well as insurance industry payouts for some of these risks. After starting to dig into the data, here are some preliminary observations about these risks:

The frequency distributions for these different risks vary considerably, so it may not be appropriate to model them all the same way. Risks 3) and 5) both have average frequencies that are greater than their variances. Risk 4) has the same mean and variance for its frequency distribution. Finally, risks 1 and 2) have frequency distribution variances that are greater than their means.

Regarding severity, for some of these risk events we were lucky to have multiple external data sources that we could piece together (e.g., both General Insurance and Life Insurance model error events). Also, some of these external data sources have events that would not be likely for our insurance operation, so I had these events carved out of the data. Finally, I made adjustments to the severity data to account for the differences in size between our company and the companies in the study. After these modifications to the raw data, we then used a Maximum Likelihood Estimation (MLE) technique to find and fit an appropriate distribution for this data for each risk.

The above of course is just a start, and our approach may need to change as we get further into the details. However, I wanted to invite any thoughts you have at this stage.

AHA Contingent Compensation Program for Brokers – Email Correspondence

Date: January 24, 2023

To: Patrick Lyon, Co-CEO
From: Jean Manx, Lyon Risk Manager

You asked me to get further information on the new compensation program that AHA intends to put in place for the brokers. I learned the following from AHA:

For brokers, AHA has implemented a set of contingent compensation agreements to provide for payment when the broker achieves pre-set goals for: (i) volume and (ii) growth and retention. A broker may have separate contingent compensation plans with our different business units. AHA will evaluate performance against pre-set goals annually. If the broker has met the goals, the payment amount is usually a percentage of the premium a broker has placed with us for specific types of insurance. The sales department will monitor this system.

The contingent compensation plan will use one or more goals, separately or in combination, to determine if a broker will receive a payment. These goals may include:

Volume

AHA will measure the premium volume of policies a broker places with us. We may measure one or more types of insurance.

Growth and Retention

AHA will measure whether the amount of business a broker has with us is increasing or decreasing. We may look at change in premium volume, change in the actual number of policies, number of newly written polices, policy-renewal ratios, or a combination of these. These calculations may vary by type of insurance.

Profitability has been excluded from the plan due to the timing difficulties of measuring profitability by case in the year of the sale.

Patrick, please let me know if you have any concerns or want me to do further follow-up.

Merger and Acquisition – Email Correspondence

From: Feng Hu, Treasurer
To: Laila Lynx, CFO

Date: March 20, 2023

Laila,

You are aware of Lyon Corporation's policy on acquisitions by our subsidiaries. We allow the affiliates to pursue potential acquisitions if they are supported by the affiliate business plan approved by the Lyon Board. I've become aware of certain activity occurring within AHA, and I think we need to keep ourselves informed of how these potential transactions are progressing.

The Lyon Board has three overarching principles for approval of any acquisition identified by the affiliates:

1. The acquisition should be strategic to the affiliate.

2. The acquisition should provide clearly identifiable benefits.

3. The risks involved in the integration must be clearly identified, along with appropriate risk management responses to be taken.

I'm not sure that AHA is appropriately focused on these principles.

I have obtained the following summaries from Neisha Kampango, the AHA CFO. I'd appreciate it if you could make sure she keeps you up to date on AHA's progress.

Potential Acquisitions

I. Currently, AHA has targeted Eureka Insurance Company (Eureka), a health insurance company, as a potential acquisition target. Eureka is domiciled in New York and is in the small and large group medical markets in the state of New York. About 40% of Eureka's large group premium represents employer groups with fewer than 101 employees.

Eureka's products include comprehensive major medical coverage of hospital services, physician services, dental services, and prescription drugs. Dental is offered as an additional benefit on medical.

Eureka has contracted with Networks 'R Us to use their provider networks for physician and hospital services. It also has contracts with Carefree Rx, a Prescription Benefit Management company (PBM), and Painless Dental to manage and administer their prescription drug and dental plans, respectively. In order to lower costs, it periodically puts its network contracts out to bid. While this may lower premiums, it has been disruptive to members in the past.

Eureka relies on its vendors for standard medical claims management. The company has a medical management staff that coordinates with the vendors' medical managers to ensure that the vendors meet New York requirements and that their policies are consistent with the Eureka product language.

Compared to AHA, the management of Eureka appears to be more conservative. However, since their company covers the entire state of New York, they have experience dealing in diverse markets (rural to cosmopolitan).

According to Neisha, due diligence related to the potential acquisition identified certain key issues that need closer review:

1. Determine whether the Eureka administration system, which is a home-grown system, is compatible with AHA's system.

2. Ensure that the policy and claims reserves at Eureka are adequate and that the underlying assumptions and calculations are reasonable.

3. Understand why the broker and administrative costs are higher than expected.

Two years of historical financial statements and a one-year projection for Eureka are attached at the end of this report, as well as an internal memo from the manager Neisha assigned to oversee this project. AHA would value the acquisition of Eureka at a hurdle rate of 10%.

II. Recently, AHA has become aware of another potential acquisition target, Columbia Health. Through research, AHA has learned the following information about this potential target:

-Industry: Columbia operates in the LTC market.

-Geography: Although Columbia is based in New York, it operates in almost all U.S. States. It focuses its efforts in smaller cities and towns where it perceives that there is less competition.

-Products: Columbia offers long term care insurance to individuals and small groups. Columbia does not sell any other insurance products, and the company does not have any insurance subsidiaries.

-Provider Networks: Columbia negotiates contracts directly with external providers. It targets individual primary care doctors, who are sole practitioners, and home care agencies for its LTC product; as a result, Columbia is able to negotiate more profitable arrangements than might otherwise be available.

-Internal administration processes and systems: Columbia has contracted out all aspects of this function. Policyholders submit claims to an external third-party administrator, and payments are processed by that company.

-Underwriting function: Most of Columbia's underwriters have been with the company since its inception and have developed close relationships with their small business clients. For cases with unusual features, Columbia relies on its reinsurer for advice.

-Governance: Managed by its founder, Columbia is a very conservative company. The founder treats his employees as if they are family members. Their compensation is well above industry average and is totally fixed; there is no variable compensation. Columbia does not have an internal ERM function. It relies on external consultants for all regulatory considerations, such as valuation reports, economic capital, and rate filings.

Attachment I: Eureka Financial Statements

2021 – 2022 are actual results; 2023 is projected

TOTAL	2021	2022	2023
Statutory Income Statement (000s)			
Earned Premiums	1,449,283	1,460,556	1,472,408
Health benefits	1,209,507	1,198,706	1,217,317
General expenses	269,862	270,152	273,353
Total Expenses	**1,479,370**	**1,468,859**	**1,490,670**
Investment Income	**7,501**	**7,618**	**8,068**
Income Before Income Tax	**(22,585)**	**(685)**	**(10,194)**
Federal Income Tax	**(6,324)**	**(192)**	**(2,854)**
Net Income	**(16,261)**	**(493)**	**(7,340)**
Statutory Balance Sheet (000s)			
Total Assets	**363,091**	**366,654**	**361,293**
Liability for unpaid claims and claim adjustment expenses	155,798	160,661	161,965
Other Liabilities	84,058	83,252	83,927
Total Liabilities	**239,856**	**243,913**	**245,892**
Surplus	**123,235**	**122,741**	**115,401**
Total Liabilities and Surplus	**363,091**	**366,654**	**361,293**

Attachment II: Project Manager Memo – Eureka Acquisition

Date: March 15, 2023

Subject: Eureka Acquisition

To: Neisha Kampango, CFO, AHA

From: Sue Mahi, MBA, Project Manager, AHA

I have been working with our consultant and broker on this project and I believe it is an important and exciting opportunity for our organization. Our consultant's actuaries and financial folks asked that I pass along several minor details that they have found while digging around in the publicly available data and financials. They say they need to look at these areas more closely during due diligence.

- They think the medical loss ratio is low.
- Broker fees and administrative costs are a bit high.
- Low surplus backed by illiquid assets.

None of these items are insurmountable, especially considering our financial strength and marketing expertise. As a result, I do not see any deal breakers here.

Again, I cannot stress enough the fact that this is an important and exciting opportunity.