Compilation of Variables Necessary for Performing Dynamic Financial Analysis of Insurance Companies

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under the direction of the
CAS Task Force on DFA Variables

COMPILATION OF VARIABLES NECESSARY FOR PERFORMING DYNAMIC FINANCIAL ANALYSIS OF INSURANCE COMPANIES

Final Stage One Report Submitted to
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Abstract. In recent years, a virtual consensus has emerged within the casualty actuarial science community that actuaries must broaden their role in insurance organizations by developing a set of tools that will enable them to render expert opinions regarding not only loss reserves but the overall value and solvency of the firm as a whole. In order to support this effort to broaden the roles of casualty actuaries, the Casualty Actuarial Society has embarked upon a many-year, multi-stage project entitled Dynamic Financial Analysis. This aim of the project is to set up a general actuarial framework for the modeling and financial evaluation of insurance companies as risk-assuming, ongoing entities. The outcome of the project will likely be general specifications for insurance company financial models, a database of important variables to support these kinds of models for the purposes of research and model design, and suggested procedures and considerations for those who would design, use and interpret these models. This is the final report for stage 1 of the Dynamic Financial Analysis project.

1. INTRODUCTION AND OVERVIEW

The Casualty Actuarial Society has embarked upon a many-year, multi-stage project known as Dynamic Financial Analysis. This aim of the project is to set up a general actuarial framework for the modeling and financial evaluation of insurance companies as risk-assuming, ongoing entities. The outcome of the project will likely be general specifications for insurance company financial models, a database of important variables to support these kinds of models for the purposes of research and model design, and suggested procedures and considerations for those who would design, use and interpret these models. Some of the specifications expected for a Dynamic Financial Analysis Model are as follows:

1. It should be able to account for and evaluate the things that are most likely to affect the value of the company.
2. It should produce probability distributions of financial outcomes.
3. It should provide enough detail to allow evaluations of outcomes on a variety of accounting bases, such as on-going, run-off, etc.
4. It should produce risk/return consequences of changes in major management decision variables.
5. It should recognize the interplay among various segments of the company and also with various external variables.
6. It should be devised as a strategic management tool, with regulatory compliances features regarded as byproducts, albeit mandatory ones.

As originally conceived, the Dynamic Financial Analysis project is expected to consist of four stages occurring over the next few years:

1. Stage 1: Identification of variables and data sources
2. Stage 2: Creation of a research database

3. Stage 3: Analysis
4. Stage 4: Specifications and feasibility plan for a permanent widely accessible database

This is the final report for Stage 1 of the CAS Dynamic Financial Analysis project. The outline of presentation will be as follows. The next section sets forth a set of general considerations that ought to be considered in dynamic financial analysis.[1] The third section of the report provides a discussion of variables and data sources. The fourth section of the report provides some recommendations for setting up the database for further research, and the fifth section discusses some possible future directions for research to complete the further stages of the project.

2. General Considerations

In recent years, a virtual consensus has emerged within the casualty actuarial science community regarding the future role of the profession. It is now widely believed that actuaries must "re-engineer" themselves by becoming "actuaries of the third kind" (see Bühlmann (1987) and D'Arcy (1990)). This will require developing a set of tools that will enable actuaries to render expert opinions regarding not only the value of loss reserves, but the overall value and solvency of the firm as a whole.

The need for dynamic financial analysis has been anticipated in the actuarial literature, well before terms such as the "appointed actuary" and "dynamic financial analysis" became popular. For example, D'Arcy (1990) presents the very compelling argument that factors such as the

[1]The report is generally agnostic insofar as model selection is concerned, focusing primarily upon the identification of variables and data sources. It is the primary responsibility of the CAS Committee on Valuation and Financial Analysis (VFAC) and its subcommittees to decide and advise the CAS concerning model selection and parameterization (see CAS Subcommittee on Dynamic Financial Models (1995) and Szkoda, *et al.* (1995)). The next section of the report does, however, set forth the argument that dynamic financial analysis can and should incorporate a rigorous integration of financial economics with actuarial science.

growing importance of investment performance in insurance operations, increasing volatility in financial markets and the emergence of investment-linked insurance contracts are creating the need for actuaries to develop new skills and a greater awareness of investment performance. Bühlmann (1987) refers to actuaries who understand both the asset and liability structures of insurance companies as actuaries of the "third kind".[2]

The importance of integrating actuarial science and finance has been recognized by actuaries and financial economists alike, and has resulted in the development of a literature on the convergence of the two fields. Borch (1985), Boyle and Butterworth (1982) and D'Arcy (1990) present lucid analyses from the actuarial perspective, whereas Garven (1987) and Smith (1986) approach this topic from a financial economics perspective. The reference section of this report provides a research bibliography that addresses financial theory and its applications to insurance and actuarial problems.

Besides the parallels between finance and actuarial science that have been noted to exist in published literature, common approaches in practice are also observed. For example, deterministic and stochastic techniques described in a number of CAS reports (e.g., see CAS Subcommittee on Dynamic Financial Models (1995) and Szkoda, *et al.* (1995)) bear a close resemblance to capital budgeting techniques that are presented in some of the more popular corporate finance textbooks (e.g., see Brealey and Myers (1991)).[3]

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[2]According to Bühlmann, actuaries of the first kind are life actuaries whose methods primarily involve deterministic calculations. Casualty actuaries are actuaries of the second kind, in the sense that they develop probabilistic methods for dealing with risky situations (for example, using methods such as scenario testing and Monte Carlo simulations). Actuaries of the third kind address investment and underwriting aspects of insurance companies and apply principles from financial theory to create more fully integrated models of the insurer.

[3]In the finance literature, the seminal work on the use of simulation in the evaluation of corporate capital projects was done by David Hertz (1964, 1968). In the tenth chapter of

Historically, financial research has tended to oversimplify insurance markets and institutions, whereas robustly specified actuarial models of insurance markets and institutions often lack the analytic rigor and economic foundations that have become the hallmark of financial research.[4] However, in recent years, there have been extensive applications of financial theory and empirical methods to the analysis of property-liability insurance markets and institutions. For example, there is now an extensive finance literature applying the capital asset, arbitrage pricing and option pricing models to the problem of the "fair" rate of return in property-liability insurance markets.[5,6] Option pricing models have particularly important implications for dynamic financial analysis, as they allow for a stochastic modeling framework in which asset and liability management impacts the value of the firm *and* its solvency level.

Furthermore, an extensive finance literature has developed that analyzes, both theoretically and empirically, the economics of organizational structure. In view of the significant degree of

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Brealey and Myers, the cases for and against both simulation and scenario testing are summarized. Although the finance literature champions risk analysis, it is generally very critical of simulation analysis in particular (see Lewellen and Long (1972)).

[4]Indeed, although finance is essentially a field of applied economics, it has experienced remarkable success as a scientific discipline. This has culminated in the awarding of the Nobel Prize in Economic Science five years ago to three financial economists: Merton Miller, William Sharpe, and Harry Markowitz for their seminal research on corporate capital structure, asset pricing and portfolio theory.

[5]For applications of the capital asset pricing model (CAPM) to insurance pricing, see Biger and Kahane (1978), Fairley (1979), Hill (1979), Hill and Modigliani (1987) and Myers and Cohn (1987). Kraus and Ross (1982) provide a more general framework based upon arbitrage pricing theory, and Doherty and Garven (1986), Cummins (1988b), Derrig (1989), and Phillips (1995) provide solutions to the fair return problem in a contingent claims, or option pricing framework.

[6]A particularly important paper in this literature is by Phillips (1995), who derives an option pricing model that allows for the determination of premium levels by line of business for a multi-line insurance company. He also finds empirically that insurance prices are inversely related to the riskiness of the firm, as predicted by the option model. This inverse relationship is stronger for long-tail lines of business than for short-tail lines, suggesting that the default premium increases the longer the payout tail.

cross sectional variation in ownership structures and distribution systems that exists in the property-casualty insurance industry, this is a particularly relevant literature. Of particular interest is the question concerning whether incentives exist for firms adopting different organizational features to optimally employ different risk management strategies. To date, the empirical evidence is generally consistent with testable hypotheses contributed by financial models of insurance companies. Specifically, it appears that mutual insurance companies tend to adopt more conservative investment and underwriting strategies than do stock insurers. Mutuals have been found to concentrate a larger proportion of their investments in financial assets and smaller proportions in non-financial assets than stock insurers (see Fama and Jensen (1983)). After controlling for size, stock companies write relatively more business in riskier lines of insurance (see Lamm-Tennant and Starks (1993)) and reinsure less (see Mayers and Smith (1990)) than mutuals.[7] Stock insurers also tend to be more highly leveraged and bear more interest rate risk than mutuals (see Doherty and Garven (1995)). Finally, Babbel and Staking (1989, 1990) show that the market rewards (in the form of a higher stock price) firms that match asset and liability durations. Clearly, some consideration ought to be given to the incorporation of the perspectives offered by the theoretical and empirical studies cited above in the further development of the underlying theory that supports dynamic financial analysis.

3. IMPORTANT VARIABLES

[7]Mayers and Smith (1990) find that widely held stock insurance companies cede proportionately less reinsurance than any other ownership class, including mutuals. Although they also find weak evidence that single-owner stock insurers reinsure more than mutuals, this is to be expected since risk aversion is more likely to be an important motivating factor for closely held than for widely held firms.

Appendix 1 provides an initial partial list of some of the factors relevant to insurer solvency and management planning, and was included with the original Stage 1 DFA request for proposals as an attachment. Furthermore, in the CAS Subcommittee on Dynamic Financial Models report entitled "Dynamic Financial Models of Property/Casualty Insurers" (see CAS Subcommittee on Dynamic Financial Models (1995)), attention is focused on the following classification of property-liability insurance risks:

- C-1 risk - Uncertainty surrounding cash flows from invested assets other than from uncertainty regarding interest rate risk.
- C-2 risk - Uncertainty surrounding cash flows from the obligation or underwriting aspects of an insurance company.
- C-3 risk - Uncertainty surrounding cash flows from interest rate fluctuations in the presence of a mismatch of assets and liabilities and the risk of disintermediation caused by embedded options that are sensitive to changes in interest rates.

There obviously exists a high degree of correspondence between this particular classification scheme and the list of factors provided in Appendix 1. Furthermore, the factors listed above are generally incorporated in the financial literature cited earlier.

The approach taken in Stage 1 has been to orient the research primarily around variables and data sources for which information can be obtained via the Internet. In many cases, data vendors are either moving toward Internet-based distribution or allowing licensees to create Internet-based delivery mechanisms for these data.[8] Given the "distributed" nature of the Casualty

[8]The Social Sciences Data Collection at the University of California, San Diego (UCSD) (see `http://ssdc.ucsd.edu/ssdc/econ.html`) and the Yale University Social Science Statistical Laboratory (see `http://statlab.stat.yale.edu`) provide interesting "proofs of concept" for the CAS. Although access to most of the data available from these collections is restricted to on-campus users, it would certainly be technically possible to engineer similarly secured Internet-based database systems for the Society.

Actuarial Society, the Internet constitutes the best long-run solution for creating and maintaining a permanent widely accessible database for CAS members. The costs of such a system can be allocated in such a way that the CAS and its members can acquire a very efficient and cost-effective delivery system for data that can also be virtually managed and updated as needed. In fact, because the World Wide Web makes it is possible to link sites together via the so-called hypertext transport protocol (`http`), effective site management could in principle be accomplished on either a completely centralized or decentralized basis. In the last two sections of the report, recommendations are made concerning setting up the database and possible future directions for research that presume the Internet to be the computing platform of choice.

Consistent with this "net-centric" philosophy, this report and its appendices can be accessed directly from the DFA World Wide Web home page, the address for which is `http://www.risknet.com/dfa/dfa.html`. Appendix 2 lists the information that is provided there.[9] Hypertext links to Appendices 3-9 of this report are provided in the Data Access section of the home page. These appendices provide detailed listings of variable definitions, length of time series available, cost and feasibility of data acquisition, licensing issues, and information concerning levels of aggregation.

Issues such as variable interactions are more specific to model selection than to the identification of variables and data sources, which is the focus here. Nevertheless, some observations regarding variable interactions can and should be made. The general approach to modeling variable interaction is to estimate variance-covariance matrices for variables. Since the insurer may be viewed as a portfolio of assets and liabilities, a portfolio based analysis of insurer

[9]In this and later appendices, all underlined text represents hypertext links to other documents. Unfortunately this is a feature not easily replicated in the context of a hard copy, or analog document such as this.

risk and return can provide important insights into performance measurement and solvency. Halliwell (1995) presents the mathematical theory behind portfolio analysis, while Almagro and Sonlin (1995) and Lamm-Tennant (1995) apply this method to evaluating asset allocation strategies. The Lamm-Tennant paper is an especially important paper in this regard, as it provides a very rigorous yet elegant approach to estimating variable interactions on an after-tax basis. Furthermore, it is highly recommended that readers of this report look further into the JP Morgan RISKMetrics database (listed in Appendix 4 and available for free on the World Wide Web). This database provides information on volatilities and correlations among over 300 different types of financial assets.

As one would expect, most of the data that are useful for dynamic financial analysis are available on a commercial basis, and a number of vendors are already beginning to experiment with different forms of World Wide Web-based distribution. Appendix 3 lists commercial vendors who provide comprehensive financial and economics database products. For financial analysis, the CRSP and COMPUSTAT databases are particularly useful; indeed, most of the best academic research on firm valuation uses these databases. The CITIBASE database is unparalleled in its breadth and depth of coverage of interest rate and macroeconomic data.

Unlike insurance data, there is an abundance of economic and financial market time series data already available on the Internet. Furthermore, access to many of these databases is free, although this is not universally the case. Appendix 4 lists a number of free data sources. These data sources that are the most "professionally" presented and supported are demarcated with special "NICE!" icons. These include the Federal Reserve Bank of St. Louis' *FRED* Database, Financial Markets Data from the Federal Reserve Bank of Chicago, volatility, correlation, and

price index data from JP Morgan, and the EDGAR Database. All of these resources, with the exception of JP Morgan, are funded by government or quasi-government agencies, and they are intended to provide reliable access to some very high quality data sources. Indeed, much of the data listed under the *General Economic Time Series* and *Performance Measures for Investment Instruments* headings in Appendix 1 can be accessed from these resources.

Appendices 5-9 provide information about insurance data that are available from a number of commercial vendors. In addition to providing insurance data through traditional means such as diskette, tape, and CD-ROM, a number of these vendors feature proprietary online services.

4. RECOMMENDATIONS FOR SETTING UP THE DATABASE FOR FURTHER RESEARCH

Currently, a number of commercial database vendors distribute data using proprietary CD-ROM products or proprietary network interfaces. Good examples of CD-ROM products for insurance data include the A.M. Best and OneSource products, whereas proprietary (i.e., non-Internet) online insurance database products include A. M. Best's BestLink, the NAIC's InsureNet, and the NCCI's InsNet. However, World Wide Web-based access is fast becoming a preferred method of distribution for a number of reasons. Although there are important reasons to be concerned about security on the Internet, it is now widely believed that the Internet, rather than proprietary wide area networks, will increasingly become the network solution of choice for commercial organizations. Indeed, information technology has become one of the most dynamic sectors of the U.S. economy, and tremendous amounts of capital are being invested to find ways to secure the Internet.

Secondly, along with innovations in security, the speed of Internet access is increasing dramatically at a time when access costs are plummeting. This is causing the economics of a net-

centric as opposed to a CD-ROM based or proprietary network-based distribution system to become very compelling. By locating the data on a central World Wide Web server, mistakes are easily and cheaply corrected, and updates to the database can be made at minimal cost. Furthermore, it matters not whether the consumer uses a computer running the DOS, Windows, Macintosh, or Unix operating system, because the World Wide Web provides a "platform-independent" system of distribution. This lowers costs even further, since all program coding can be done according to open rather than closed and proprietary standards. The World Wide Web will therefore make it possible for data vendors (and/or possibly their licensees) to create much less expensive and easier to use methods for data access and analysis. The NAIC and NCCI are already giving serious consideration to the possibility of developing net-centric approaches to distributing insurance data, and I expect that other vendors such as A. M. Best and OneSource will eventually be compelled by market forces to seriously consider the development of similar distribution systems.

Net-centric data distribution will also enhance the ability of the Society to more effectively develop and implement standards for dynamic financial analysis. CAS members can expect to interact increasingly via email and the Web for the purpose of not only accessing data, but also critically discussing and debating modeling issues. Indeed, many of the functions now performed by meetings and publications of the CAS are likely to migrate toward this environment.

5. Possible Future Directions for Research

Stages 2 through 4 envision the actual creation of a research database, analysis, and the development of specifications and a feasibility plan for a permanent widely accessible database

system. Assuming that the Society is willing to embrace the Internet as its computing platform of choice, I think that the future course of the project can be modified somewhat. The next logical step would be to launch a pilot test of a distributed database system. The Society needs to identify a cadre of important and influential members who are willing to serve as "beta testers" for the pilot test. The pilot test needs to be coordinated by a Stage 2 researcher who has strong financial modeling and information technology skills. This individual will need to work closely with the beta testers for the purpose of creating proper specifications for the research database.

Besides funding a Stage 2 researcher, the budget will also require funding for the development of a World Wide Web site from which the database can be distributed. Essentially, the Stage 2 researcher will need to be an "Internet integrator" who can take a leadership role in persuading data vendors to "buy into" the pilot test by either creating their own secure and metered data feeds into the system or providing the CAS with the licensing necessary in order to administer such a system for its members.

In order for the second stage to be a success, it will require active participation from some very committed members of the Society. It will be important to include a mix of consulting, company and academic actuaries if at all possible, as this will facilitate the development of very broad and objective feedback to the Stage 2 researcher.

Finally, the CAS needs to foster and support a cultural environment that enthusiastically embraces emerging and important information technologies such as electronic mail and the World Wide Web. Not only will this facilitate the eventual development and implementation of a permanent and widely accessible database, but it will also enhance the ability of the Society and its members to compete even more effectively.

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Appendix 1

An Initial Partial List of Some of the Factors Relevant to Insurer Solvency and Management Planning

General Economic Time Series
Inflation measures, such as CPI components, GNP/GDP deflators
Output measures
Employment measures
Interest rates, by term
Exchange rates

Performance Measures for Investment Instruments
Stock market, by segment, large vs. small, by *b*?, various exchanges
Bonds - corporate, muni, federal, by term, in various economic environments
Precious metals
Other commodities
CMO's and derivative products
Derivative products
Real estate, including rental value:

Insurance Industry Data
Premiums, losses, expenses, investment income, taxes, etc. by line. Accident year too.
Annual statement aggregates at least in detail of NAIC profitability report by line
Payout patterns by line and changes over time
Development patterns by line and changes over tune
Frequency and severity distributions by line and changes over time
Insolvencies and retirements with 5 years of data prior to
Matching group of solvent companies

Natural and Unnatural Disasters
Frequency and severity by location by type and changes over time
Impacts on insurance industry
Effectiveness of various mitigation programs for business interruption, including that of insurers

Appendix 2: DFA Home Page

(http://www.risknet.com/dfa/dfa.html)

CASUALTY ACTUARIAL SOCIETY

Dynamic Financial Analysis

Introduction

Welcome to the Casualty Actuarial Society (CAS) Dynamic Financial Analysis (DFA) Home Page. The CAS has embarked upon a many-year project entitled Dynamic Financial Analysis. It is anticipated that this prototype World Wide Web site will eventually evolve into a full scale distribution mechanism for a permanent and widely accessible research database.

The original Request for Proposals for the DFA project can be accessed by clicking here. The winning proposal for Stage 1 of the DFA project can be accessed by clicking here.

Data Access

- Financial and Economics Databases -- Click here to access information concerning commercial financial and economics databases. Click here to access information concerning free financial and economics databases.
- Insurance Industry Data -- From A. M. Best, ISO, OneSource, NAIC, and NCCI.

DFA Stage 1 Liaison Team Corner*

- DFA Discussion Archive
- DFA Stage 1 Preliminary Report
- Addendum to the DFA Stage 1 Preliminary Report
- DFA Stage 1 Final Report

*Participation limited to the principal investigator and the DFA Liaison Committee

Other CAS Web Sites

- CAS Committee on Theory of Risk*

*Participation limited to members of COTOR

Other Sites of Interest

- Important Variables Survey Form -- Friends and members of the Casualty Actuarial Society are welcome to make further suggestions about variables and data sources by filling out this survey form. Click here to view an archive of all such submissions.
- *Financial Theory and its Applications to Insurance/Actuarial Problems* -- a Research Bibliography.
- Agenda for the Limited Attendance Workshop on Financial Risk Theory, held October 1, 1995 at the Boston Marriott, Copley Place.
- Economics Data catalogued in Bill Goffe's Summer 1994 *Journal of Economic Perspectives* article entitled *Resources for Economists on the Internet* (Current version: Vol. 1, No. 12, January, 1996).
- Actuarial Resources on the Internet
- Jacobson Associates' listing of job openings for actuaries

Last Updated 3/7/96.

Appendix 3: Financial And Economics Database Products

(http://www.risknet.com/dfa/finance/commerce.htm)

CASUALTY ACTUARIAL SOCIETY

Financial and Economics Databases

This page provides information concerning commercially available financial and economics database products.

Berkeley Options Database

The Berkeley Options Data Base is a historical record of trades and quotes, time-stamped to the nearest second, for all standardized contracts traded on the Chicago Board Options Exchange. The data base, which is derived from the CBOE's Market Data Retrieval tapes, begins in August, 1976 and is updated annually. Data are currently available through December, 1994.

Boston International Advisors

Boston International Advisors maintains a family of international stock market indices with historic returns and values beginning in 1975. The indices cover the performance of sectors of country stock markets based on growth and market capitalization. Approximately 5,000 stocks are included from over forty countries.

Citibase

The CITIBASE database contains approximately 7,000 monthly, quarterly, and annual economic and financial time series that date back to 1946 when available and end with the latest available observations. These data are collected from various government and private sources and distributed by FAME Information Services - a subsidiary of CITICORP. Monthly and Quarterly variable definitions and periods of time series are available on-line, as is a spec sheet that summarizes FAME's Financial, Index, Fundamentals, and Estimates Data Groups.

CRSP (Center for Research in Security Prices)

The Center for Research in Security Prices (CRSP) at the University of Chicago produces a number of data files on U.S stocks and government securities. The CRSP databases are very comprehensive and reliable, constituting one of the most important sources of security market data for researchers in the field of financial economics.

- The CRSP Stock Files contain stock price and return data for companies listed on the New York (NYSE), American (AMEX), and NASDAQ Stock Exchanges. Daily data are available from as early as 1962 for NYSE/AMEX securities, and 1972 for NASDAQ securities.

- The CRSP Bond Files contain term structure, bond price and return data. End-of-day price data on virtually all negotiable direct obligations of the United States Treasury are available during the period December 31, 1925, to the present.

More detailed information about these databases can be obtained by downloading and printing the 205 page manual for the CRSP Stock Files and the 75 page manual for the CRSP Bond Files. (***Important Note:*** *You will need to download and install a free program called Adobe Acrobat in order to view and print either of these documents.*)

Hoover's MasterList Plus Database

The Hoover's MasterList database was created and is maintained by The Reference Press, Inc. of Austin, Texas. This searchable database contains information on 6,700 publicly traded companies in the United States. Each company profile provides basic information needed for locating, communicating with, and evaluating the companies listed in the database.

Intex Solutions - Collateralized Mortgage Obligation data

Intex CMO Database lists over 30,000 bonds, modeled and updated every month.

Standard and Poors

Includes Comstock, J. J. Kenny Drake, Ratings Services, Platt's, MMS International, DRI/McGraw Hill, and the CUSIP Service Bureau.

Standard & Poors Compustat

COMPUSTAT provides superior accounting statement information on companies from around the world.

U.S. Commerce Department STAT-USA /Internet

The Department of Commerce gathers business and economic information from over 50 Federal Agencies and redistributes this information for a nominal subscription fee from its world wide web site. STAT-USA/Internet provides access to the National Trade Data Bank (NTDB), the National Economic, Social, and Environmental Data Bank (NESE-DB), the Economic Bulletin Board, the Global Business Opportunities Service, and the Bureau of Economic Analysis databases.

Last Updated 3/7/96.

CASUALTY ACTUARIAL SOCIETY

Free Data Sources

This page provides information concerning freely available financial and economics data sources

General Economic Data

Federal Reserve Bank of St. Louis' *FRED* Database NICE!

FRED stands for "Federal Reserve Economic Data". This free data source provides historical U.S. economic and financial data, including daily U.S. interest rates, monetary and business indicators, exchange rates, and regional economic data.

Business Cycle Data

Gordon's Business Cycle book a lengthy appendix which contains finance and macroeconomic data. It is provided in a text file (300K) in a SAS program format (not a SAS dataset) here.

Consumer Price Index. Monthly, 1913-1995

Financial Market Data

Financial Markets Data from the Federal Reserve Bank of Chicago NICE!

The Federal Reserve Bank of Chicago provides free and comprehensive financial markets datasets, including Foreign Exchange Rates, Selected Interest Rates, and Money Markets. Many datasets include daily data going all the back to 1971.

JP Morgan NICE!

JP Morgan is using the Internet to offer information needed to implement their RiskMetrics methodology and to provide data which can help managers control risk of their positions by using information on volatilities and correlations among over 300 financial assets. J.P. Morgan offers the following data for free: Commodity Index, Currency Indices, Emerging Markets Bond Index Plus, and a Government Bond Index.

Monthly Treasury Bill Rates, 1934-1995

This series provides averages of the daily closing T-Bill rate.

Treasury Bond Futures Data, 1994-95

This is an ASCII data file that contains high and low prices over 20 minute intervals on Treasury Bond futures from Jan 7 1994 to Feb 3 1995, for a total of 5347 observations. Variables reported include date, time, high price and low price. An hourly series is also available.

Term Structure Data Excel spreadsheet - 1.1 megabytes

McCulloch/Kwon US Term Structure Database

This data set offers U.S. Treasury term structure data for the period 1947-1991.

Aggregate Stock Market Information

Most of the following data are current as of year end 1995:

- All 4,417 Tickers, Company Names and SIC Codes for NYSE
- All 10,616 Tickers, Company Names and SIC Codes for OTC
- All 1,445 Tickers, Company Names and SIC Codes for AMEX
- The 500 Companies in S & P 500 Ranked by 1995 Stock Price Appreciation
- Dow Jones Industrials Performance Since 1929
- Monthly Stock Price Performance of S&P 500 since 1984 (Last 2/29/96)
- The 500 Companies in S & P 500 -- Stock Price Performance P/E Yields, etc.

New York Stock Exchange Daily Returns & Volume 1962-1992

Weekly Dow Jones Industrial Average 1900-1989

This dataset lists an important aggregate stock price index beginning in 1900. The data is in date, high, low, close, volume format. A daily version of this dataset is also available, but it nearly 2 megabytes in size and starts in 1915.

Corporate Data

EDGAR Database NICE!

EDGAR is the Electronic Data Gathering, Analysis, and Retrieval system. It is a free service provided by the Securities and Exchange Commission (SEC). EDGAR is an important source of corporate financial report data, providing online access to the complete 10Ks, 14Ds, S3s, 8Ks etc. of most public companies in the US over the last few years. Nearly three-quarters of the publicly traded domestic (U.S.) companies use EDGAR to make the majority of their filings, and all registrants will be required to do so starting May 1996.

Corporate Debt Issues, 1983-93

This Excel file (2.7MB) lists over 10,000 bonds, convertibles, Euronotes, MTNs, Warrant bonds and other issues by company and CUSIP number (where available). Click here to download the same file in comma separated value format (1MB). For more information about the data click here.

This page has been visited 0 0 0 3 1 times since March 5, 1996.
Last Updated 3/7/96.

A. M. Best

Insurance Data

This page points to insurance data available from A. M. Best Company.

More detailed information about A. M. Best Property and Casualty Insurance database products can be obtained from their world wide web site. The address for A. M. Best's home page on the World Wide Web is http://www.ambest.com.

Details on the A.M. Best Database

Like OneSource, A.M. Best is a valued added reseller of NAIC annual statement data. A.M. Best runs each company's statement data through a rigorous process of intra and inter-page cross checks to ensure accuracy. Furthermore, A.M. Best also provides other useful information that extends well beyond the data on a company's annual statement.

The two key file types of interest to researchers include the A.M. Best Statement and Product Files. Statement Files retain the basic organization structure of the NAIC annual statement. All key data items found on a given page or schedule are presented in an individual file. Product Files present selections of data provided in several of A.M. Best's print publications, such as Best's Insurance Reports, Best's Insurance News, Best's Key Rating Guide, Best's Market Guide, and Best's Experience By State (By Line). Furthermore, A.M. Best also provides a Custom Files service that supports the creation of custom data selections. Furthermore, Best's has developed its own proprietary network for online access to data called BestLink, allowing access via local access telephone numbers as well as with IBM's `advantis` network. The pricing of these services (valid as of March 1996) are as follows):

STATEMENT FILES retain the basic organization structure of the NAIC annual P statement. All key data items found on a given page or schedule are presented in an individual file.

		Statement Pages Included on File	Standard Products Available	Any Single Year of Data	Each Additional Year of Data	Five Years of Data
PC-BF-01	Balance Sheet	2,3	Tape/Disk	$525	$175	$1,050
PC-BF-02	Income Statement	4	Tape/Disk	$375	$125	$750
PC-BF-03	Cash Flow	5	Tape/Disk	$375	$125	$750
PC-BF-04	Investment Income & Capital Gains/Losses	6	Tape/Disk	$525	$175	$1,050
PC-BF-06	Premiums Written (By Line)	8	Tape/Disk	$525	$175	$1,050
PC-BF-09	General Expenses	11	Tape/Disk	$525	$175	$1,050
PC-BF-11	Stocks&Bonds-Summary	29	Tape/Disk	$555	$185	$1,110
PC-BF-12	Bonds-Quality&Maturity Distribution	30-33	Tape	$975	$325	$1,950
PC-BF-14	Loss Reserves	72-126	Tape/CD	$8,500	N/A	N/A

PC-BF-14-Z	Loss Reserves-Summary	72,73	Tape	$850	N/A	N/A
PC-BF-15	Direct Business (By State)	131	Tape/Disk	$525	$175	$1,050
PC-SF-16	Underwriting Analysis with Ratios (By Line) - IEE	IEE	Tape/CD	$1,200	$400	$2,400
PC-SF-52*	P/C Best's Statement File (with Best's Ratings)	N/A	CD	N/A	N/A	$10,000

PRODUCT FILES present selections of data provided in several of A.M. Best's Statement printed publications, such as Best's Insurance Reports, Best's Key Rating Guide, Best's Market Guide, and Best's Experience By State (By Line).

		Statement Pages Included on File	Standard Products Available	Any Single Year of Data	Each Additional Year of Data	Five Years of Data
PC-PF-01	Name & Address	N/A	Tape/Disk	$450	N/A	N/A
PC-PF-02*	P/C Exp. by State (By Line) All Sts.-Standard Lines	14:All Sts.	Tape/CD	$4,500	$1,500	$9,000
PC-PF-02A*	P/C Exp. by State (By Line) Standard Lines	14:Ea. St.	Tape	$375	$125	$750
PC-PF-03*	P/C Exp. by State (By Line) All Sts.-Combined Lines	14:All Sts.	Tape	$4,500	$1,500	$9,000
PC-PF-03A*	P/C Exp. by State (By Line) Per St.-Combined Lines	14:Ea. St.	Tape	$375	$125	$750
PC-PF-05*	P/C Key Rating Guide (with Best's Ratings)-Regular Service	N/A	Disk	N/A	N/A	$175
PC-PF-05*	P/C Key Rating Guide (with Best's Ratings)-Full Service	N/A	Disk	N/A	N/A	$535
PC-PF-05S	P/C Key Rating Guide-Supplement (2nd & 3rd Qtrs.)	N/A	Disk	N/A	N/A	S75
PC-PF-50	P/C Best's Ins. Reports (with Best's Ratings)-Regular Service . .	N/A	CD	$2,500	N/A	N/A
PC-PF-50	P/C Best's Ins. Reports (with Best's Ratings)-Full Service	N/A	CD	$2,860	N/A	N/A
PC-PF-01	Name & Address	N/A	Tape/Disk	$450	N/A	N/A

BESTLINK SERVICES is A. M. Best's proprietary online database that provides continually updated financial data on more than 3,800 insurers, as well as daily insurance-related news.

Unlimited Access Options

Users requiring frequent and extensive access to one or more BestLink databases can purchase the right to unlimited access to the file(s) by prepaying the equivalent of the basic file cost (magnetic tape or CD-ROM file) plus 30%. If you have already purchased a current data year file on tape or CD-ROM, you can be credited the tape or CD-ROM price toward the unlimited access price and charged the additional 30%. (Example: If you purchased the Statement File at $10,000, you can receive unlimited BestLink access for an additional $3,000.)* Note: The $15 per hour Connect Time charge will still apply.

	Tape/CD Price	Unlimited Online Access Charge (30%)	Total Price
Loss Reserves/Schedule P (P/C)	$8,500	$2,550	$11,050
Schedule D (P/C)	$3,060	$918	$3,978
Underwriting Analysis with Ratios (IEE)-(P/C)	$2,400	$720	$3,120
Experience By State (By Line)-Std. Lines (P/C)	$9,000	$2,700	$11,700
Experience By State (By Line)-Cmb. Lines (P/C)	$9,000	$2,700	$11,700
Insurance News	$500	$150	$650
Statement File* (P/C)	$10,000	$3,000	$13,000
Best's Company Reports	$2,500	$750	$3,250

*Best's Statement File on CD-ROM includes unlimited access to the corresponding databases on BestLink: Profile Annual, Profile Quarterly, Financial, Schedule D, and Reinsurance-Summary (P/C only).

CUSTOM FILES

To order custom data products, call A. M. Best Custom Products & Services at (908) 439-2200, extension 5383.

Insurance Services Office

Insurance Data

This page points to insurance data available from Insurance Services Office (ISO).

The Insurance Services Office section of DFAWeb is under "heavy construction". Please come back later for a more complete site.

OneSource US Insurance: Property and Casualty

Insurance Data

This page provides details concerning insurance database services available from OneSource.

More detailed information about the OneSource US Insurance: Property and Casualty products, including software demos, can be obtained from their world wide web site. The address for OneSource's home page on the World Wide Web is http://www.onesource.com.

Details on the OneSource Database

1. Definition

OneSource Information Services (OIS) offers more than 50 electronic business information titles that respond to market demands for products that combine high quality information with state-of-the-art access and manipulation software.

In the case of the OneSource US Insurance: Property and Casualty products, OIS delivers 5 annual statement information titles that include the company financials, (including the IEEs), the page 14 State and LOB information, and the full details of Schedules P, F and D. The source of the information is the National Association of Insurance Commissioners (NAIC) with whom OIS has a long term redistribution agreement.

2. How long a time series is available?

Most of the financial information is presented in an integrated 5 year historical series. The Schedule P, F and D products are current year only.

3. Cost and feasibility of obtaining

OneSource does not publish a price list to the public, but their products are delivered on a flat price annual subscription basis that varies with number of databases accessed and number of user groups. While the data are delivered on CD/ROM, OneSource "products" include customer-specific training and intensive support services. The products are Windows-based and can be run on i486 or higher PCs with configurations for stand alone computers or local area networks (LANs).

The first delivery of the annual financial information, including Schedule P, occurs at the end of March for the previous year's data. OIS refreshes the database around April 15th and around the 15th of each month there after. New information continues to flow in during the spring and early

summer in consonance with the deadlines for the various filings, i.e. Combined Filings for groups, quarterly filings, etc. Schedules D and F are initially released around the 20th of April and updated two additional times in the summer and fall.

4. Legal considerations: who owns and confidentiality

Subscribers must sign and adhere to the provisions of OneSource's product license agreement. Like other software license agreements, this document requires the subscriber to acknowledge that the product is a copyrighted work, and that the data is the property of the data vendor. The agreement spells out how the product can be installed & used, what the subscriber's redistribution rights and restrictions are, and addresses the issue of indemnity.

5. Available by company or by larger groupings?

The financials and Schedule P are available for both individual companies and for the "combined" NAIC filing groups. Users can manipulate the datadase using 10,000+ different criteria to form additional groupings for peer group analysis or benchmarking.

6. Other relevant information

The products can be directly accessed from either Lotus 1-2-3 or Microsoft Excel by using the OneSource Add-in. This feature empowers the spreadsheet user who wants to develop proprietary analytical and graphical models. The needed information is tagged using controls in the add-in software and it then flows automatically into the spreadsheet from the CD/ROM.

OneSource's Schedule D holdings database includes the complete securities portfolio of every holding of every company. The holdings data can be manipulated to develop groupings based types, classes and quality, as well as many other criteria.

National Association of Insurance Commissioners

Insurance Data

This page provides details concerning insurance database services available from National Association of Insurance Commissioners (NAIC).

The NAIC Database Products Catalog provides further descriptive information. The address for the NAIC's home page on the World Wide Web is http://www.naic.org

Details on the NAIC Database

Definition: The NAIC maintains the largest insurance industry database in the world, with over 4700 Life/Health and Property Casualty companies. This accounts for 98% of all U.S. domiciled insurance companies. The information on the NAIC database captures nearly all of the information from the statutory filings that the insurance companies are required to submit. The database also contains information filed by Title, Fraternal, and HMDI companies.

The number of insurance companies reporting to the NAIC and the availability of their data to the commercial market is as follows:

Company Type	Number of Companies	Filing Date	Data Availability
Life	1,692	3/1	4/1
Property	2,685	3/1	4/1
Fraternal	139	3/1	4/1
HMDI	119	3/1	4/1
Title	91	3/1	4/1
Combined Filings	P/C 325 L/H 234	5/1	5/15

The information on the database dates back to 1984. Any or all years of data can be extracted from the database.

Timeliness: Preliminary data for the current filing year is available as early as the first week in April, as indicated in the table above. The database is finalized and complete in the second week of June.

Formats Available: Requests for nearly any media or format are easily accommodated by the NAIC. Available media types include CD-ROM, 3.5 inch diskette, cartridge tape, or reel tape. Data can be produced in mainframe formats, comma delimited formats for use with PC's, as well as many other formats.

Legal Considerations : The NAIC requires customers to sign a Database License Agreement. This agreement is a standard contract that describes payment, shipping, and order processing terms. The contract also describes how the data may be used. The standard License Agreement specifies that the data is for internal use only and redistribution is not allowed. When necessary, a customized License Agreement can be written to accommodate certain uses not permitted in the standard contract.

Availability by individual company or company groupings: The customer has total flexibility in the selection of the type and number of companies selected. Data can be extracted for all companies in the database, or for customized lists of companies. The NAIC Database Products technical team can also extract data for companies chosen by custom selection criteria as specified by the customer.

Pricing: There are standard prices for many parts of the database. Pricing for some of the most commonly requested information is as follows:

	Life/Health	Property Casualty
Standard "A" List (see attached list of schedules)	$24,000	$34,500
Schedule D Detail (All Parts)	$ 5,000	$ 8,000
Schedule F (All Parts)		$ 8,000
Schedule S (All Parts)	$ 4,500	
State Page Data	$ 2,300	$ 3,300
State Page CD-ROM/Reports	$ 3,000	$ 4,000
Balance Sheet/Income Statement	$ 1,100	$ 1,300

Pricing for custom orders is determined by individual estimate.

National Council on Compensation Insurance
Insurance Data

This page provides details concerning insurance database services available from National Council on Compensation Insurance (NCCI).

More detailed information concerning the NCCI's InsNet Online Service and Research and Reference Products can be found on NCCI's home page on the World Wide Web, located at http://bocaraton.com/ncci/.

Details on the NCCI Databases

The National Council on Compensation Insurance, Inc. (NCCI) headquartered in Boca Raton, Florida, is the nation's largest information company serving the voluntary and involuntary Workers Compensation marketplace. The corporation provides database products, software, publications and consultation services to state funds, self insureds, independent bureaus, agents, regulatory authorities, legislatures and more than 700 insurance companies.

A description of four of NCCI's major databases follows:

Policy Issue Capture System (PICS)

The Policy Issue Capture System serves as the database of workers compensation and employers liability policies. PICS data is the information from the actual policy information page issued by the insurer to the insured. Policy data is used for controlling the submission of WCSP data, the distribution of experience ratings to insurers and for NCCI's Proof of Coverage service provided to Industrial Accident Boards and Commissions. Information on policies for the latest three years is readily available.

Financial Data Calls

NCCI collects aggregate financial data calls which are used to determine the aggregate rate or loss cost level in a state. The primary ratemaking calls are the Policy Year and Accident Year Calls for Compensation Experience by State. These calls gather collected premiums, premiums at a common level, and losses for over 15 years of aggregate financial data by state.

A major product produced from the Financial Data Calls is Loss Development Exhibits (Product Code 2911) This package of exhibits provides a history of loss development factors by state for both policy year and accident year experience. Factors are provided for four development

methodologies for indemnity, medical and total losses. The development methodologies are paid, paid plus case, incurred excluding IBNR, and incurred including IBNR. Additional exhibits in the package include paid to incurred ratios and premium development factors as well as summarized financial data. This product is available in hard copy or on diskette. The price is $1,000 per state for hard copy ($350 per state for affiliates) and $2,000 per state for diskette ($700 per state for affiliates).

Workers Compensation Statistical Plan (WCSP)

Workers Compensation Plan data is the audited exposure, premium, and loss experience summarized by policy and state on a unit report for each Workers Compensation policy. The WCSP requires losses on the unit report to be valued as of the 18 months after policy effective date. Subsequent unit reports through a fifth report are required at 12 month intervals thereafter for any policies which contain open claims as of the previous submission.

A major product produced from this database is Class Experience (Schedule Z Summary Data) (Product Code 2838) Schedule Z summarizes by class the combined experience for all affiliates in a state as reported on the Workers Compensation Statistical Plan. The report provides the class experience including exposures, premiums, indemnity losses and medical losses and claim counts by injury type. Experience is furnished for the latest five policy periods available. This product is available on hard copy, diskette, or magnetic tape. Beginning approximately second quarter 1996 Class Experience will be available through InsNet, NCCI's on-line network.

Detailed Claim Information

Detailed Claim Information (DCI) collects 85 detailed data elements describing the insured, the claimant, the claim characteristics, the benefits and payment made, and the claim administration details of individual claims. The purpose of DCI is to provide insight into the underlying elements inherent in the aggregate costs of workers compensation insurance. Claims are selected based on a sampling methodology which concentrates on collecting information for major injuries. Claims are valued at six months after accident date with subsequent reports required at annual intervals up to ten reports for any claims that remain open.

New summary publications from this database will be produced in 1996. Custom data extracts are available on diskette or magnetic tape.

Other Products of Special Interest to Actuaries

The Annual Statistical Bulletin (Product Code 2845) $225 ($145 affiliates) contains a summary of the latest and most significant statistics on Workers Compensation available. Reference tables provide histories of premium and benefit level changes by state, expense data, tax provisions, benefit provision summaries, loss development factors, and claim frequency and severity exhibits. The Bulletin in published annually in hard copy format.

Economic Conditions Report (Product Code 3043) This compendium of data and forecasts from government agencies, private companies, and universities contains comprehensive statistics that cannot be found anywhere else in one source. It provides indications of the changes that are occurring in a state's economy and how those changes impact the Workers Compensation system. Available in hard copy for $250 per state per year. ($125 per state per year for affiliates).

Legal Considerations

NCCI owns the data contained in its databases and licenses it to interested persons.

Available By Company

Specific carrier and specific risk data is not available. Custom requests may be produced for specific groups of carriers as long as the individual carrier data is protected.

Other Relevant Information

NCCI affiliates receive significant discounts on most NCCI products and services. NCCI affiliation programs are available for private carriers, state funds, self insurance groups and reinsurers.

For a complete catalogue of NCCI products and services or for more information on any NCCI product call Customer Service at 800-NCCI-123 (800-622-4123) from 8 AM to 8 PM EST.