

DWIGHT ASSET MANAGEMENT COMPANY

DYNAMIC FINANCIAL ANALYSIS RESULTS SUPPORT BUSINESS DECISIONS

As property and casualty insurance companies embrace a culture where Enterprise Risk Management (“ERM”) is becoming much more important, the need for sophisticated risk management tools has grown considerably. The identification of risks can lead to successful risk mitigation strategies as well as create opportunities to increase the short- and long-term value of the company. Dynamic Financial Analysis (“DFA”) is a process for analyzing and quantifying risk that can provide property and casualty insurance companies with the data to evaluate investment decisions, hedging decisions, capital efficiency, and profitable growth strategies. The analysis can also illuminate the effects of pricing policies, entering a new market, capital adequacy, reinsurance structure, and specific investment strategies. A good DFA tool will prompt senior management to take the necessary action when needed, and may be the closest thing to a crystal ball for seeing into a company’s future.

The DFA Model

In opposition to some traditional analysis techniques that led to managing risks in “silos,” a DFA model seeks to capture the key components of an insurance organization and attempts to incorporate the integrated relationships and correlations among them. In most cases, a DFA model simulates the company’s operations and generates thousands of potential prospective balance sheet and income statement paths.

Proprietary DFA models have their own unique features, yet most incorporate certain components.

- An economic scenario generator
- The current asset portfolio
- The reinvestment and disinvestment strategies
- Projections of future asset cashflows for both fixed income and equities
- The reinsurance strategy at both the enterprise and line of business levels
- Current and future underwriting practices
- Payment patterns of future liabilities including the effects of inflation
- A catastrophe generator
- A tax calculator

DFA models that address business decisions at the enterprise level reflect the corporate structure in the framework of the model. Each line of business in the enterprise is modeled so that separate balance sheets, income statements, and cash flows are generated. This allows the analysis and quantification of risk to occur at both the line of business and enterprise level.

Generally, balance sheet and income statement accounts (such as investment income, operating income, net income, and surplus) are selected as the risk measures for a DFA study. Several considerations will influence the selection of the appropriate metric for that particular risk measure.

- What is the corporate structure of the enterprise – stock of mutual?
- What are the key business challenges at hand?
- Who is responsible for the risk (Board of Directors, CEO, CFO, CIO, Chief Actuary, Chief Risk Officer, etc.) and what are their primary concerns?



Tsana Nobles, FSA, MAAA
Quantitative Analyst

continued on page 2

Dynamic Financial Analysis, continued from page 1

For more information:

Donald Hill
Senior Vice President
802.383.4062
dhill@dwight.com

John Loud
Vice President
802.383.4047
jloud@dwight.com

100 Bank Street
Suite 800
Burlington, VT 05401
802.383.4000

www.dwight.com

▶ **Various risk metrics measure different primary concerns. Given a risk measure (like surplus or net income) the more common metrics are:**

- Standard deviation, which measures how widely spread the data are from the expected value;
- Value-at-Risk (VaR), which measures the value of the risk measure at a given probability level. A sample result may be a *1% chance of at least a 30% decline in surplus*; and
- Tail Value-at-Risk (TVaR), which measures the average size of the risk measure beyond a given probability level. For example, *the Tail Value-at-Risk in the 1% worst cases for net income is a \$50 million loss.*

Other statistical risk metrics are commonly used to quantify risks for the enterprise. Each business decision, including the preferences and risk tolerances of the organization, dictate which are the most meaningful metrics. They can then incorporate these risk metrics and risk/return profiles that reflect the integrated relationships among the key drivers of the company’s financial results.

Determining Strategic Business Decisions & Asset Allocation Strategy

The applications of Dynamic Financial Analysis are numerous. The value of simulating all integrated relationships within a DFA model is that a property and casualty insurance company can analyze all of its major strategic decisions simultaneously within a single framework or choose to focus specifically on one distinct strategy such as asset allocation.

Determining the target split between taxable and tax-exempt bonds as well as the target allocation to equities are key components of the strategic asset allocation. In order to provide useful results regarding the allocation to tax-exempt bonds, DFA models need to have robust tax calculations.

Most DFA models utilize some type of optimization routine for determining the efficient asset portfolios and show the varying levels of expected return for various degrees of risk. These optimization routines take into account the investment guidelines including any constraints on the asset allocation. Since most DFA models are structural simulation models, the liabilities are explicitly recognized when determining efficient asset portfolios. Once the set of efficient asset portfolios has been calculated, it is possible to compare the current asset portfolio to this “frontier.” If the current asset portfolio is inefficient in comparison to the frontier, then the company can seek to improve their risk/return tradeoff by repositioning to the efficient frontier. This can be done in a manner that is intended to provide additional expected return for the same level of risk or by providing the same return for less risk. The repositioning of the assets results in a more efficient portfolio and reflects both the recommended target split to taxable and tax-exempt securities and the target allocation to equities.

Some asset managers are designing and developing DFA models in order to assist in their clients’ ERM process. Furthermore, the asset manager can gain a greater understanding of the company’s overall insurance operations and risk appetite by engaging in this analysis.

Ultimately, senior management is responsible for integrating an ERM discipline into the everyday operations of the insurance company. Using these tools, they are better able to make informed decisions.

*Written by Tsana Nobles, FSA, MAAA
Quantitative Analyst*

This article was prepared for general informational purposes only, without respect to the investment objectives, financial profile, or risk tolerance of any specific person or entity who may receive it. Investors should seek financial advice regarding the appropriateness of investing in any investment strategy or security discussed or recommended in this article and should understand that statements regarding future performance may not be realized. Investors should note that income, if any, from any investment strategy or security may fluctuate and that underlying principal values may rise or fall. Past performance is not necessarily a guide to future performance.