



SOCIETY OF ACTUARIES

Article from:

Risks and Rewards Newsletter

August 1999 – Issue No. 33

Financial Engineering

by Mark Bursinger

There has been increased discussion around finding new avenues for growth in the actuarial profession. In the investment community, there is a relatively new profession called financial engineering that requires many of the same fundamental skills acquired by actuaries. But before we jump to the conclusion that financial engineering is a good fit for actuaries, we must first understand what it is.

The International Association of Financial Engineers (IAFE), which was formed in 1991, organizes the financial engineering profession. There are about 2,000 members representing academia, industry and regulatory communities worldwide. The IAFE defines financial engineering as, "The development and creative application of financial technology to solve financial problems and exploit financial opportunities..." If you put a reference to future contingent events in this definition, it sounds a lot like actuarial science. Though I can identify with this definition, it's difficult to understand exactly what financial engineers do. A simpler definition might go like this, "Financial engineers create financial products to change risk-reward tradeoffs." In many cases, financial products are derivative securities. The users of these products range from individual investors to major corporations.

The creation of this profession was likely caused by the increased complexity of financial products and capital markets. The IAFE conducted a survey that showed that financial institutions are becoming more dependent on quantitative professionals and techniques. We can see this in our own profession as actuaries get involved in the design and pricing of guaranteed minimum benefits for variable annuities. These benefits are fundamentally options requiring the abil-

ity to understand and model financial markets.

Frederick Novomestky, Academic Director, Financial Engineering Program, Polytechnic University, Brooklyn, New York, gave a presentation at the 1998 IAFE Conference about training financial engineers. Core courses in financial engineering include financial accounting, fixed income markets, derivatives and probability and stochastic processes. Prerequisite coursework includes microeconomics, macroeconomics, calculus, probability and statistics, linear algebra, spreadsheet knowledge and exposure to computer programming. A quick glance at the actuarial syllabus reveals the similarities in educational requirements

- Banks
- Insurance companies
- Regulators and exchanges
- IT product development firms
- Energy marketing firms

At the current time, there is not a specific accreditation program for financial engineers. But don't get too excited about escaping exams. Like any other profession, employers like to have a way to evaluate the qualifications of candidates. The IAFE is planning to establish a certification program. It is anticipated that the program would include a written exam or series of exams. In addition to examination, the program would include ethical standards, standards of conduct and experience requirements. It's not

"The IAFE defines financial engineering as, 'The development and creative application of financial technology to solve financial problems and exploit financial opportunities...'"

between our professions. Especially for those that pursue the investment track.

Novomestky listed the following examples of what financial engineers do:

- Develop, price, trade, evaluate and apply new financial products
- Assess and manage risk
- Implement sophisticated investment and risk management strategies
- Design, develop, and implement the IT infrastructure for modern financial services firms

He also cited the following employers of financial engineers:

- Investment advisory firms
- Consulting firms
- Investment banks

clear when the certification program would start.

Based on what I've learned about financial engineering, I believe there will be opportunities for actuaries wishing to pursue this field. In fact, I'd suggest there are actuaries working at insurance companies or investment banks doing financial engineering type work although they may not be calling it that. More information about financial engineering can be found at the IAFE website, <http://www.iafe.org>.

Mark Bursinger, FSA, CFA, is actuarial officer at Fortis Financial Group in Woodbury, Minnesota. He can be reached at mwbursinger@us.fortis.com.