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dismal performance of “real experts.”<sup>7</sup> Indeed, what would he think about investing in this day and age in an index fund?

Having read these three books, it is hard for me to imagine a situation where I would want to make any of them assigned reading in an investments course. The first two are clearly enjoyable and entertaining, but in spite of the advertising hype, they appear to be of limited practical value in today’s world. With respect to the third, “the devil is in the details” when it comes to implementing the scuttlebutt approach. Nevertheless, I am inclined to tell students who are interested in working in the investments business to read all three of them for their entertainment and historical value, but with the following caveat: don’t expect any present-day advantages from this unless, of course, your boss is either Martin Zweig, Michael Bloomberg, or Warren Buffet.

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*Cases in Financial Engineering: Applied Studies of Financial Innovation.* By SCOTT P. MASON, ROBERT C. MERTON, ANDRE F. PEROLD, and PETER TUFANO. Englewood Cliffs, N.J.: Prentice Hall, 1995. Pp. xvii + 815.

Engineering involves the application of scientific principles to practical purposes, such as the design, construction, and operation of efficient and economical structures and systems. *Financial* engineering therefore describes the practical application of finance theory to the creation of new products, institutions, or processes that solve problems in finance and thereby increase the efficiency of the financial system. Since this term has only found its way into common use over the past decade, it is often more narrowly associated with recent advances in pricing and hedging derivative securities. However, the scope of financial engineering applications is much broader.

*Cases in Financial Engineering* is a collection of 33 Harvard Business School cases written over the past decade that present financial engineering problems

<sup>7</sup> See, for example, Lakonishok, Shleifer, and Vishny (1992) and Baumol (1995). To his credit, Fisher does recommend comparing the expert’s record with a benchmark before making a hiring decision.

encountered by corporations, financial intermediaries, and investment managers. The cases and their accompanying teaching notes illustrate the application of financial techniques and provide insight into the causes and consequences of financial innovation and the related dynamics of institutional change. A functional perspective for studying financial innovation provides a unifying theme for the book. This perspective involves analyzing products, institutions, and, more generally, the financial system in terms of the functions they deliver. This approach is presented in two essays at the outset of the book and is clearly evident throughout, especially in the teaching notes.

Given that financial engineering is an applied discipline, cases are clearly well suited as an instructional mechanism, allowing the application of financial tools and concepts to actual decision problems. The cases in this book are particularly effective for several reasons. First, they draw on most of the concepts introduced in corporate finance and investments courses, and thus take advantage of the full arsenal of financial theory. Second, the cases in this book contain an extensive amount of institutional detail about financial and nonfinancial firms and the securities they issue or purchase, including useful data provided in the exhibits. Third, the cases included in this book do not simply focus on pricing issues, but also address questions of the motivation for new products and the factors that determine the design of these instruments. Finally, the cases in the book cover a wide spectrum of situations and are written to stimulate students' interest in the material.

While there are too many cases in the book to provide a detailed description of them, a brief overview may give a sense of the specific product innovations and stimuli to innovation that are discussed in the book. The book begins with two essays that provide a conceptual and historical framework for the cases. These essays focus on the functional perspective to analyzing innovations, discussing motives for financial innovation such as completion of markets, lowering transaction costs, and mitigating agency problems. The alternative production processes for new financial products (underwriting, synthesizing, and hybrid strategies) are also outlined. The historical perspective provides interesting references to innovations over the last 150 years, and stresses the dynamic elements driving innovation, including changing costs of producing financial products, changing demands of investors and issuers, and the learning process of financial innovation. The cases are then organized consistent with the functional approach. They are grouped together to emphasize the use of financial engineering to 1) exploit arbitrage opportunities, 2) resolve information asymmetries, 3) reduce costs associated with taxes, accounting rules, or regulations, and 4) manage risks. (The particular sequencing of cases, though, need not be followed, and the authors suggest alternative structures depending on the instructor's objective.)

Starting with innovations in the debt market, the first set of cases focuses on arbitrage fundamentals, starting with the simple stripping of U.S. Government Bonds into COUGARS. More subtle arbitrage relationships are then explored in the context of complex RJR Nabisco Debentures, callable U.S. Government Bonds, and Coca-Cola Harmless Warrants. Alternative explana-

tions are explored for the existence and persistence of relative pricing discrepancies in these markets. The second set of debt innovation cases highlight the importance of taxes, regulation, and accounting rules in driving innovation. These factors affect both investor and issuers' desires for particular debt structures, as seen in the issuance of Eurodollar Floating Rate Notes, municipal put bonds, perpetual floating rate notes, and high-yield bonds. Finally, the important role of securitization in today's debt markets is explored in three cases focusing on mortgage-backed securities and the securitization of charge-card receivables. These cases help to illustrate how the underlying risks affect the structure of the securitization solution.

Innovative equity-linked securities are examined in the second part of the book. Putable stock, PERCS (Preferred Equity-Redemption Cumulative Stock), SWORDS (Stock Warrants for Off-balance-sheet Research and Development), and reset bonds are all introduced to illustrate how equity-linked securities can be designed to mitigate asymmetric information and incentive problems. In this group, there is also a case on employee stock options, which can be used not only to discuss the efficacy of incentive stock compensation plans, but also to discuss option pricing techniques and the importance of the assumptions underlying the pricing models. A second set of equity-linked securities are examined which are all motivated, at least in part, by tax considerations. These include alternative designs of corporate preferred stock and equity-linked debt, which permit a comparative analysis of the appeal of these securities to issuers and investors. The cases on preferred stock demonstrate how these innovations were progressively tailored to suit investors' preferences for a long-lived security with price and liquidity characteristics of short-term money market instruments. Waste Management's LYONs (zero-coupon putable callable convertible corporate bonds) are also studied. In addition to the cases in this part, there is a very accessible essay on contingent claims analysis which discusses how this approach can value in a consistent manner both operating and financial options involved in a firm's combined investment and financing decisions.

The third, and final, part of the book presents cases that analyze the use of derivatives by companies and investors to manage their exposures. The cases related to managing issuer's exposures deal with interest rate, currency, and commodity price exposures and involve a wide array of derivatives including forwards, futures, swaps, options, caps, floors, collars, swaptions, and spot-deferred contracts. These cases not only provide the opportunity to overview and apply risk management techniques, but also inevitably lead to discussions of the rationale for using derivatives and the assumptions underlying firms' risk management policies. Cases dealing with the management of investors' exposures illustrate the interaction of design, marketing, and production of new financial products by investment banks, the challenges of pricing new products, and the role of intermediaries in performing custom contracting for investors. Two cases related to Leland O'Brien Rubinstein Associates' portfolio insurance products illustrate alternative financial engineering techniques for creating financial products, and highlight the institutional, regulatory, com-

petitive, and technical problems encountered by firms that introduce new products.

A strength of the book is its versatility. The authors present the financial engineering applications in a way that is accessible to a wide audience. While students will benefit most from the cases if they already have an introductory course on derivatives, this is not essential (there are, in fact, some overview notes included that provide basic material on derivatives). Selected cases can be used in courses on capital markets, investments, derivatives, corporate finance, banking, or risk management. The book can be used most fully, however, in an upper-level course on financial engineering that can be designed as a capstone course, building on earlier corporate finance and investment courses.

If an upper-level course is designed with more of a pricing and risk-management focus, oriented towards a technically proficient student group, the instructor can supplement a selection of cases in the book with journal articles or working papers that present more complex pricing techniques. Students should be asked to perform spreadsheet analyses, and these assignments could make use of cases in the book (and especially the data in the exhibits). For example, students can be assigned to construct a binomial tree on a spreadsheet in order to value (and perform sensitivity analysis on) the Waste Management LYONs. Another possibility would be to supplement the discussion of mortgage-backed securities in the Travelers CMO case with lectures or reading assignments on interest rate trees and prepayment models, and then to ask students to construct a simple Monte Carlo simulation model to analyze the pricing of different CMO tranches.

Having taught several of the cases contained in *Cases in Financial Engineering*, I have found them to be very effective pedagogic tools. The cases are well written, clearly set out the problem, and provide sufficient background to perform the analysis needed to make an informed decision. The students found the cases interesting and challenging. The teaching notes provide useful assignment questions (together with accurate numerical solutions), carefully lay out teaching plans that demonstrate how to draw out the main points of the case, and provide numerous additional suggestions to help stimulate lively discussion in the classroom.

In terms of shortcomings, there are a few additions that might be useful. First, new cases could describe recent innovations such as exotic options and structured notes. Second, while a subject index is referred to in the table of contents, it was not included in the current edition. This is unfortunate since it will make it more difficult for readers to quickly reference descriptions or data in the book unless they have read through all the cases first. Third, while some of the teaching notes listed references to journal articles that the instructor could consult, there was a lack of consistency among teaching notes in this regard, and many recent relevant articles were not included, particularly in connection with some of the older cases in the book.

Overall, the cases included in this book do an effective job of presenting interesting financial engineering problems that require a consideration of the

rationale for innovation, the efficient design of securities, and the pricing of new products. I highly recommend this book to those interested in learning more about financial engineering and the process of financial innovation, and to those teaching courses in related areas.

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*Lease or Buy*. By JAMES S. SCHALLHEIM. Boston, Harvard Business School Press, 1994. Pp. xi + 215.

This book provides business practitioners with an in-depth, and generally lucid, introduction to the lease-or-buy problem. Given that leasing is virtually always an option when a significant asset acquisition is undertaken, the topic is relevant to a major portion of capital investment decisions. The book proceeds logically and addresses the main relevant issues in terms that should be intelligible to most business managers with a background in financial analysis. Although I offer some suggestions on how the book might be improved, I believe that it is a useful addition to the library of anyone interested in the subject.

Chapter 1 briefly sketches the role of leasing and its significance relative to purchase as a way that users acquire assets. Several themes that pervade the book are introduced immediately: market forces establish lease terms, market “imperfections” create the potential benefits from leasing, and one’s interpretation of a lease transaction may depend on whether one is an “efficient markets” advocate (one who believes that markets are competitive and efficient and that rational, wealth-maximizing behavior predominates) or a member of the “psychological” school (a devotee of the notion that market prices often fail to correctly reflect information and that profit opportunities consequently exist for the highly astute). Schallheim expresses a preference for the efficient markets view, and this preference sets the tone of the book.

Assuming efficient markets, potential advantages of leasing are catalogued. Leasing can offer advantages only if markets are “imperfect” in the sense that there are tax distortions, transaction or contracting costs (including contract enforcement costs), or noncompetitive markets. Leasing occurs when there are benefits, such as tax savings, circumvention of debt covenants that proscribe the purchase (but not the lease) of assets, reduced costs of financial distress (because a lessor may be able to assert its rights against a defaulting asset user at lower cost than would a lender), and lower transaction and information costs (such as those associated with optimal maintenance of assets and optimal risk-sharing).

Chapter 2 describes various kinds of lessors and profiles the more popular forms of lease contracts. There is the financial lease, operating lease, leveraged lease, and sale-and-leaseback (and various subspecies of each). A potentially important addendum to a lease is the option to purchase the asset, to renew