

INSIDE *the* MINDS

Textbook Finance

The Fundamentals All
Business Professionals Should
Know and Remember

Deborah J. Lucas • Northwestern University

Anjan Thakor, University of Michigan • Maclyn L. Clouse, University of Denver

Laurence Booth, University of Toronto • Kenneth Lehn, University of Pittsburgh

Allan E. Young, Syracuse University • John C. Edmunds, Babson College



Inside the Minds: Textbook Finance: The Fundamentals All Business Professionals Should Know & Remember

by Deborah J. Lucas et al. ISBN:1587621169

[Aspatore Books](#) © 2003 (164 pages)

This is the most authoritative book ever written on the essentials of finance for the business professional. It pulls readers through all things financial from beginning to end.

Table of Contents

[Inside The Minds— Textbook Finance—The Fundamentals All Business Professionals Should Know & Remember](#)

[Chapter 1](#) - The Standard Model of Finance

[Chapter 2](#) - Portfolio Performance Basics: Still Vital After All These Years

[Chapter 3](#) - Practical Approaches to Finance in Business And Education

- [Chapter 4](#) - Understanding the Implications of Market Efficiency
- [Chapter 5](#) - Lessons From Market Efficiency
- [Chapter 6](#) - Valuation—The Essence of Finance
- [Chapter 7](#) - Current Issues and Concerns in Finance

Back Cover

Inside the Minds: Textbook Finance is the most authoritative book ever written on the essentials of finance for the business professional. Featuring Chairmen of Finance Departments from some of the nation's leading Business Schools, these pages brim with contributed chapters akin to objective, experience-related, white papers or essays on the core issues of finance, to make for an overarching as well as in-depth presentation of the fundamentals—the unspoken rules and the important issues for the future. From the history of financial matters to the key concepts that help to govern the ways in which business operates, this book pulls readers through all things financial from beginning to end. The different niches represented and the varied perspectives presented, enable readers to really get inside the great academic minds of finance as they go back to basics in a must-read for the business professional.

Inside The Minds— Textbook Finance—The Fundamentals All Business Professionals Should Know & Remember

If you are interested in forming a business partnership with Aspatore or licensing the content in this book (for publications, web sites, educational materials), purchasing bulk copies for your team/company with your company logo, or for sponsorship, promotions or advertising opportunities, please email store@aspatore.com or call toll free 1-866-Aspatore.

Published by Aspatore, Inc.

For corrections, company/title updates, comments or any other inquiries please email info@aspatore.com.

First Printing, 2003 10 9 8 7 6 5 4 3 2 1

Copyright © 2003 by Aspatore Books, Inc. All rights reserved. Printed in the United States of America. No part of this publication may be reproduced or distributed in any form or by any means, or stored in a database or retrieval system, except as permitted under Sections 107 or 108 of the United States Copyright Act, without prior written permission of the publisher.

ISBN 1-58762-116-9

Inside the Minds Managing Editor, Carolyn Murphy, Edited by Jo Alice Hughes, Proofread by Stephanie Afonso, Cover design by Scott Rat-tray & Ian Mazie

Material in this book is for educational purposes only. This book is sold with the understanding that neither any of the authors or the publisher is engaged in rendering medical, legal, accounting, investment, or any other professional service. For legal advice, please consult your personal lawyer.

This book is printed on acid free paper.

A special thanks to all the individuals that made this book possible.

The views expressed by the individuals in this book (or the individuals on the cover) do not necessarily reflect the views shared by the companies they are employed by (or the companies mentioned in this book). The companies referenced may not be the same company that the individual works for since the publishing of this book.

Inside The Minds
Empowering Professionals of All Levels
With C-Level Business Intelligence

www.INSIDEthEMINDS.com

The critically acclaimed *Inside the Minds* series provides readers of all levels with proven business intelligence from C-Level executives (CEO, CFO, CTO, CMO, Partner) from the world's most respected companies. Each chapter is comparable to a white paper or essay and is a future-oriented look at where an industry/profession/topic is heading and the most important issues for future success. Each author has been carefully chosen through an exhaustive selection process by the *Inside the Minds* editorial board to write a chapter for this book. *Inside the Minds* was conceived in order to give readers actual insights into the leading minds of business executives worldwide. Because so few books or other publications are actually written by executives in industry, *Inside the Minds* presents an unprecedented look at various industries and professions never before available.

For information on bulk orders, sponsorship opportunities or any other questions, please email store@aspatore.com.

For information on licensing the content in this book, or any content published by Aspatores, please email jonp@aspatores.com.

To nominate yourself, another individual, or a group of executives for an upcoming *Inside the Minds* book, or to suggest a specific topic for

an Inside the Minds book, please email jason@aspatore.com.

Publisher of Books, Business Intelligence Publications & Services

www.Aspatore.com

Aspatore is the world's largest and most exclusive publisher of C-Level executives (CEO, CFO, CTO, CMO, Partner) from the world's most respected companies. Aspatore annually publishes C-Level executives from over half the Global 500, top 250 professional services firms, law firms (MPs/Chairs), and other leading companies of all sizes in books, briefs, reports, articles and other publications. By focusing on publishing only C-Level executives, Aspatore provides professionals of all levels with proven business intelligence from industry insiders, rather than relying on the knowledge of unknown authors and analysts. Aspatore publishes an innovative line of business intelligence resources including Inside the Minds, Bigwig Briefs, ExecRecs, Business Travel Bible, Brainstormers, The C-Level Test, and Aspatore Business Journals, in addition to other best selling business books, briefs and essays. Aspatore also provides an array of business services including The C-Level Library, PIA Reports, SmartPacks, and The C-Level Review, as well as outsourced business library and researching capabilities. Aspatore focuses on traditional print publishing and providing business intelligence services, while our portfolio companies, Corporate Publishing Group (B2B writing & editing), Aspatore Speaker's Network, and Aspatore Stores focus on developing areas within the business and publishing worlds.

Chapter 1: The Standard Model of Finance

John C. Edmunds

Arthur D. Little School of Management

Babson College

Chairman, Finance Faculty

Introducing the Standard Model

Over the past half-century a consensus has formed among experts about the way to run the finances of a company. During the same time period a consensus also formed about the way to manage a portfolio of stocks and bonds. The principles that have emerged all relate to the relationship between investors and the companies that issue securities. That relationship is subtle, and studying it has been fruitful. Each new breakthrough about how to choose securities for a portfolio has had implications for how corporate financial managers should run the finances of a company, and has given insights into which securities the company should issue and which projects it should undertake.

The principles of portfolio optimization and the principles of corporate financial management have developed during the same time frame and in tandem with each other. This half-century of development has identified several main principles, each of which has shown its validity and its usefulness. Together they constitute a paradigm that has gained widespread acceptance. In this chapter we call that paradigm the Standard Model, and we show these principles and how they work. Each individual principle makes sense, and statistical evidence shows it adds value. These principles work synergistically, so a company that follows them all does better than a company that follows only one of them.

These principles did not immediately revolutionize the practices of corporate financial managers everywhere. First they gained universal acceptance among theoreticians, and then they gained acceptance among portfolio managers. Among corporate financial managers, they gained acceptance more slowly.

Among financial managers at large U.S. corporations, this set of principles has become the completely dominant view. The recent wave of financial scandals illustrates in a perverse way how completely dominant this view has become. Managers at Enron and WorldCom were

trying so hard to apply the set of principles, and were so determined to be the best at applying them, that they broke laws and reported fraudulent data. They went to extremes to create the appearance that they were especially successful at applying the principles.

As U.S. financial markets attempt to rebuild the credibility they lost and recover from the blows they suffered, and as U.S. corporations attempt to rally their stock prices, leaders reaffirm their conviction that the set of principles is valid. As large U.S. corporations replace top managers and directors, each newly appointed person makes a point of affirming and endorsing the Standard Model.

Outside the United States, top managers of large publicly-traded corporations have been slower to accept the validity of the Standard Model, and some still express disagreement with the principles. They argue that the Standard Model is inappropriate for one reason or another and condemn the extreme behavior that sometimes occurs when managers slavishly follow the principles. Outside the United States, old paradigms of financial management and old rules of thumb still have some shreds of legitimacy. Their days are numbered, however, and the old rules will soon pass from the scene. These non-U.S. managers may express resistance, but despite the merit of some of their arguments, the Standard Model will eventually triumph completely over all competing paradigms that dictate how to run a corporation's financial affairs.

The Standard Model has inexorably become dominant for a simple reason: Applying these principles lowers a company's cost of capital. Every company needs to lower its costs, whether those costs are for raw material, labor, or obtaining capital. No company can willingly give its competitors a cost advantage, so if one company lowers its cost of capital, the others in the same industry sector have to lower theirs, too.

The first practitioners to adopt the Standard Model were institutional portfolio managers. There are several reasons they were quicker to grasp its advantages than corporate financial managers. One is that

the first breakthrough was a scientific analysis of the tradeoffs involved in selecting securities for a portfolio. Another is that their performance was in plain view, and it was easy to measure and rank. They were supposed to earn high returns without taking excessive risks. Hundreds of institutional portfolio managers were trying to do the same thing and trying to outperform each other. Any observer could easily see which ones were particularly successful or unsuccessful. For managing portfolios of securities, the Standard Model's guiding principles are much better and much more helpful than the old rules of thumb that in bygone days institutional portfolio managers attempted to apply.

In contrast, the performance of corporate financial managers was harder to observe. Corporate financial managers were not solely responsible for the performance of the companies they worked for, and many corporate financial managers did not have as much autonomy. Many of them were only providing a support function in an industrial corporation that was deriving its profits mostly from some oligopoly advantage or from some patented product. They did not have such clear and powerful incentives to adopt new practices.

The Standard Model is the synthesis of several component models that are well known in their own right and that describe how buyers and sellers behave and how financial markets work. These components form a unified whole that gives precise numerical answers to all major questions and that fits together in a logical and mathematically complete way. The Standard Model is so successful that in many subfields of finance, researchers no longer try to posit new models to supplant it; instead, they study the mechanisms in the financial markets that have not yet been explained with the methodologies of the Standard Model.

This chapter gives an overview and an example of each of the principles that together constitute the Standard Model of financial management. Then it gives examples of financial decisions that corporate managers face, showing how the formulas of the Standard Model

work synergistically to guide the managers to the correct decisions. Before describing the principles, however, we need to state the pre-conditions for the Standard Model to deliver its benefits.

Legal and Social Infrastructure

Every business operates in a legal and social environment, and the Standard Model assumes that a sophisticated framework of institutions is in place and is functioning properly. In view of the recent financial scandals, it is relevant to state several essential characteristics that a country's financial system has to have.

There has to be rule of law. White collar criminals have to face prosecution, conviction, and long jail sentences. They also have to face financial penalties large enough to wipe out all their wealth and leave them permanently impoverished. There has to be vigilant regulation of securities markets to prevent manipulation. The rights of minority shareholders have to be paramount. If minority shareholders do not get the returns they are entitled to, the country's capital market will be defective. It will only allocate capital to borrowers who can give strong guarantees. It will not allocate capital to risky projects, and it will not bankroll very many startups or young entrepreneurs with good ideas.

This institutional framework is easy to describe but hard to create. As recent events have shown, the framework is always in danger of assault. Stealing is always a temptation, and every time society becomes complacent, a new generation of scoundrels finds ways of undermining the systems of checks and balances.

The First Principle: Portfolio Diversification

The starting point for the Standard Model is risk aversion and the tradeoff between risk and return. Most market participants are risk averse, and savers have good reasons to be especially risk averse. In the aggregate, the people who supply savings to the markets are more risk averse than the would-be users of other people's savings. This mismatch has been a prime mover for financial innovation and is a major part of the *raison d'être* for financial intermediation. Intermediaries work to remedy the mismatch and earn profits when they succeed.

Savers put their money in bank accounts, and they also buy bonds and common stocks. They hold a mix of assets, and they vary the mix of assets according to how optimistic or pessimistic they feel about future economic conditions, according to how much risk they can afford to take, and according to how old they are. For them to buy a risky security, they have to believe its future returns will be high enough to compensate them for the risk they are taking.

Finance experts have known those points for centuries. The new discovery came in 1952, and it gives a way of calibrating how risky a security is. The discoverer, Harry Markowitz, noticed that professional portfolio managers do not invest 100 percent of a portfolio in the security they think will go up the most. Instead, they invest in many different securities, diversifying the holdings among a wide range of different securities.

The breakthrough was that Markowitz computed a measure that nobody had computed before. He measured the amount of risk reduction this strategy of diversifying the portfolio achieved. He did this with a mathematical technique that is quite simple and easy to illustrate.

To see Markowitz's method, consider a risky security. In this example we use the common stock of an oil company. This company operates in a country with the necessary institutional infrastructure, so the

shareholders will get the benefit if the company does well. The company has oil wells, so if the price of oil rises, its revenues and profits will rise. The company will pay some of the higher profits to the shareholders, so if the price of oil goes up, the stock price will rise. If the price of oil goes down, the stock price will fall, but not by very much. It will fall only a small amount because the company will survive and will probably continue to pay dividends, and the oil price might rise during some later time period.

To continue with the example, let us suppose the oil stock is selling at \$20 a share at the beginning, before the oil price goes up or down. Let us suppose that if the oil price rises, one year later the stock will have gone up to \$28 a share; and if the oil price falls, one year later the stock will have fallen to \$18 a share. Assume these price fluctuations include the cash dividends the oil company pays, so, for example, if the company paid a dividend of \$0.50 during the year, the ending stock prices would have been \$27.50 and \$17.50.

This oil stock is a risky security because its price can go down and also because the range of outcomes is wide for such a short time horizon as one year. A risk-averse investor would not buy this stock, or would buy only a very small amount, so that the stock's fluctuations would not destabilize the entire portfolio.

Now consider another risky security. This second one is the common stock of an airline. This particular airline is more stable than most, and is not facing much risk of bankruptcy, but its operating results are very vulnerable to fluctuations in the price of jet fuel. Its profits rise and fall with the price of oil. If the price of oil falls, jet fuel will be less expensive, and the airline will do well. If the price of oil rises, the airline will not do as well. Suppose that at the beginning, before the price of oil falls or rises, the airline stock price is \$40. If the price of oil falls, the airline stock price will rise to \$56 after one year, and if the price of oil rises, the airline stock price will fall to \$36 after one year. Again, these ending prices include dividends the airline pays to its shareholders. For example, if the dividend per share were \$1, the ending stock

prices would have been \$55 and \$35.

This second security is also quite risky, and a risk-averse investor would not buy it. It is exactly as risky as the oil stock. It can deliver a return of 40 percent or a loss of 10 percent.

Markowitz measured the risk of each security by computing a statistical measure of dispersion called the standard deviation. This was a big advance, because earlier writers had not used such a precise, easy-to-compute indicator of risk.

The real breakthrough that Markowitz made, however, was to point out that these securities are much less risky if they are combined in a portfolio. He developed a method of computing how much risk the diversified portfolio has, and contrasted the risk of the portfolio with the risk of each individual security in the portfolio.

To see the effect that diversification has on reducing the risk of owning securities, consider a portfolio that has shares of the oil company stock and the airline stock in it, and no other securities.

The portfolio is

- 1/2 invested in shares of the oil company; and
- 1/2 invested in shares of the airline.

Each of these stocks is quite risky by itself, but when they are in this simple portfolio, they are much less risky. In fact, in this example, the portfolio's value after one year comes out the same, whether the price of oil rises or falls. To verify this, let us compute the value of the portfolio after one year. Suppose the investor began with \$200,000 and at the beginning put \$100,000 into each of the two common stocks. The investor would buy 5,000 shares of the oil company stock and 2,500 shares of the airline stock. So the portfolio would consist of

- 5,000 shares of oil company stock; and
- 2,500 shares of airline stock.

One year later the portfolio would be worth \$230,000, regardless of whether the price of oil rose or fell. The value of each individual stock in the portfolio would have risen or fallen, but the total value of the portfolio would come out to be worth \$230,000 in both cases.

If the price of oil rose, the oil stock would have risen to \$28, so that portion of the portfolio would be worth \$140,000, including the dividend the oil stock paid during the year. The airline stock would have fallen to \$36, so that portion of the portfolio would be worth \$90,000, including the dividend the airline stock paid during the year. The total value of the two holdings would be \$230,000.

If the price of oil fell, the oil stock would be worth \$90,000, and the airline stock would be worth \$140,000. Both figures include the dividends the stocks paid during the year. As before, the total value of the two holdings would be \$230,000.

In this idealized example, the strategy of diversifying the portfolio works so well because the two stocks respond in exactly opposite ways to the oil price. Their returns are perfectly negatively correlated.

Several caveats are in order. First, the portfolio is still vulnerable to other macroeconomic events, so it is not completely risk-free. Second, finding two stocks whose returns are perfectly negatively correlated is difficult in real life.

This first breakthrough had many implications and had a profound effect on financial management. It explained why portfolio investors were willing to buy risky common stocks, despite being quite averse to risk. It explained why some risks did not scare them away and why other risks, which did not look any greater by themselves, were red flags.

Corporate treasurers gradually learned how to design securities so that portfolio investors would consider the securities attractive. Treasurers revised their view of shareholders. In the centuries before 1950, the dominant view was that shareholders were like business

partners. They understood the characteristics of the businesses they invested in and tolerated the ups and downs of those businesses. If an entire industry sector had a slump because of overcapacity, shareholders understood the situation and rode through the slump, looking forward to better times. They did not blame the managers of the companies and did not sell the shares.

After Markowitz, corporate treasurers came to understand that shareholders are not business partners. They buy common stocks because they expect the shares will deliver returns and offset the risks of other shares in their portfolios. They hold the shares as long as the shares perform those roles in the investors' portfolios. When the shares cease to perform, or when shares that can perform better become available, the investors sell the shares. They do not feel any sense of shared destiny with the companies or loyalty to the managers of the companies.

There were many implications, and soon specific techniques appeared for calculating whether a security would be attractive to buyers. Portfolio managers used these techniques, and corporate treasurers soon had to master the techniques and apply them to tailor the securities they sought to issue. The ones who did this successfully got more capital for their companies, and they got it more cheaply. The ones who did not adopt the new view were still able to get capital for their companies, but they got less of it, and their companies had to pay more for it.

The Second Principle: Optimizing Capital Structure

The next breakthrough happened in 1958. The typical corporation gets money by borrowing it and by selling shares. Different corporations use these two sources of financing, debt and equity, in different proportions. The old rule of thumb was that companies with stable cash flow could rely more on debt financing, and companies that were more cyclical had to use less debt financing and rely more on funds from shareholders. There was no satisfactory proof of this rule of thumb, besides the experience of the marketplace. Two writers, Modigliani and Miller, sought to understand why companies choose to obtain capital from these two sources in specific proportions. They observed that companies appear to have an ideal mix of debt and equity financing in mind. The mix of debt and equity financing is called capital structure, and when a company sets a target for its mix of debt and equity financing, finance experts say it is making a capital structure decision.

To probe the underlying rationale for choosing debt or equity financing, Modigliani and Miller used a method of analysis that in mathematics is called proof by contradiction. They started by asking whether it makes any difference whether the company uses debt financing or equity financing. They asserted, as a way of challenging the old rule of thumb, that companies would not be worth any more or any less if they were financed 100 percent with debt or 100 percent with stockholders' equity. Then they began testing this bold assertion to see whether it is true or false.

Their initial assertion triggered a healthy debate among finance experts, and by 1962 a much deeper understanding of the capital structure decision had emerged. The debate revealed that capital structure does matter – a company can be worth more if it uses debt and equity financing in the appropriate proportions. The debate also revealed that if a company is using too much equity financing, it can raise its stock price by borrowing money and then using the money to buy back

some of its shares in the open market. This maneuver changes its capital structure and raises its ratio of debt to equity financing. Many companies have done this, and the maneuver is now called a common stock buyback.

Many seasoned executives were skeptical of this maneuver. They did not see why the company should be worth more after it alters its mix of debt and equity financing. They thought the company's stock price went up only because the company was buying its own shares. Some of them believed the maneuver was a manipulation and denied that it creates real value. As the debate among experts continued, however, these executives finally had to admit that capital structure does make a difference. There are many ways of understanding why optimizing a company's capital structure creates value. All of these ways rest on a premise that needs to be stated clearly at the beginning. The premise is that investors are not buying the whole company; they are buying only small amounts of its stock or bonds. If an investor is buying the whole company, its value depends on how the company will fit with the investor's other businesses and operations. An investor who is buying only a small amount of the company's stock or bonds thinks of different issues. If the investor is buying the company's bonds, he or she judges how risky the bonds are and tries to assess whether the projected yield is high enough to compensate for the risk. If the investor is thinking of buying the company's common stock, he or she judges how risky the stock is by itself and how risky it will be in his or her portfolio. Once this premise is stated, the assertion that a company's capital structure affects its value sounds more reasonable. Once everyone agrees that the entire company is not for sale, and that it is a going concern, then everyone agrees the company will raise new funds from time to time. The buyers will be passive portfolio investors, who will not try to exercise control over the company, and who will only put the securities in their portfolios.

Then it makes sense to talk about how many bonds the company should try to sell during a given time interval, relative to the amount of stock it has outstanding. The company finances itself by offering two

classes of securities: bonds targeted to risk-averse investors and common stock targeted to risk-tolerant investors. It puts out amounts of each type according to the demand. If it tries to put out too many bonds, investors will refuse to buy or will demand a higher coupon rate. If it puts out too much stock, the market price of the stock will decline.

The Third Principle: Pricing Risky Securities

The Markowitz technique gave a method of figuring out how risky each security is, relative to another individual security, but it did not give a calibration for the risk of each security vis-à-vis a standard benchmark of risk. Beginning in 1966, Sharpe and three other writers put forward methods that calibrate how risky an individual security is. They distinguished two types of risk: a type that can be eliminated by diversification, like the vulnerability to fluctuations in the price of oil in our earlier example, and risk that cannot be eliminated by diversification. They called these two types of risk unsystematic and systematic, or diversifiable and undiversifiable. The model they put forward is called the Capital Asset Pricing Model. Its key parameter is the measure of risk of an individual security, and they used the Greek letter beta to represent that.

The Capital Asset Pricing Model was a breakthrough because it simplified Markowitz's method. After it came out, more portfolio managers could apply scientific portfolio selection criteria. It helped in two other ways that were equally important. It allowed independent observers to calibrate whether one portfolio manager was taking more risk than another. In the past, there had been star managers who took big risks and sometimes made big returns for their clients. The Capital Asset Pricing Model allowed observers to tell whether these star managers had achieved their superior performance by selecting mostly risky stocks or by selecting safer stocks. Managers who take bigger risks sometimes do well, but are more likely to have periods of very bad performance. The other way it helped was to give analysts a formula that could predict the effect on a company's stock price if it acquired another company, sold off a division, issued bonds and then bought back its common stock, or took any other major step.

This breakthrough accelerated several trends in portfolio management and corporate financial management. It gave the scientific portfolio managers another advantage over the old portfolio managers who relied on rules of thumb. It broke the remaining ties of loyalty that were

still remaining between stockholders and corporate treasurers. Professional portfolio managers attracted more money, and individual investors handed over more and more of their assets to professionals and paid them to manage the assets. Corporate treasurers learned quickly that they had to offer securities with attractive features, or they would have difficulty placing the securities. Buyers were experts, and they eyeballed each new issue critically before deciding whether to buy any of it. There were no longer as many gullible buyers, no captive buyers, and no buyers who would subscribe to a new issue for reasons of loyalty. The new formula made it too easy to compute the correct price of the security, and if the company tried to get a price higher than that, the buyers would shun the issue.

The Fourth Principle: Pricing Options

In the period 1972-73 there was a fateful coincidence. Three developments happened in a short span of time, and together they spawned a revolution in corporate finance. The pressures on corporate financial managers until that time were intensifying, but the events of 1972-73 ratcheted up the intensity.

The events began when Black and Scholes published a formula for valuing the price of an option. This formula used more advanced mathematics than the three breakthroughs that preceded it. Time might have elapsed before the formula would have come into widespread use, but the other two events put the formula to work almost immediately.

Hewlett Packard began marketing a high-end hand-held calculator that could find solutions to the formula quickly. The calculator was expensive, and many scientists did not buy it because they could solve formulas on their mainframe computers. But the third event was that the Chicago Board of Trade launched a new category of product, options on common stocks. These were different from futures contracts, which were what the Board of Trade had offered before. These options on common stocks were difficult to value, and the young traders who acted as market makers knew that. Some of them found the Black-Scholes formula and the new Hewlett Packard calculators, and as soon as they had those two tools, they were able to buy options that were underpriced and sell options that were overpriced.

Other market makers who did not use those two tools were trying to do the same thing, and their methods were less accurate. Option trading is a fast-moving game, and a market maker can make hundreds or thousands of trades a week. The people who used the formula and the calculator had an advantage, making fewer errors and higher average profits on each trade. In a very short time the formula and the calculator were absolute requirements for survival.

Trading volume in options grew rapidly. Portfolio managers and individual investors found ways of using the Chicago Board of Trade options. The options allowed them to alter the risk characteristics of their portfolios and to stabilize the rates of return their portfolios delivered. By using the options correctly, a sophisticated investor could buy risky securities with high expected yields but high volatility and convert them into a portfolio that was quite stable. The options added stability to portfolios that had already been made as stable as Markowitz's and Sharpe's techniques could make them.

Corporate treasurers saw what was happening, and some of them began to investigate ways of applying the new options to improve the financial stability of their companies. For them, the new options were another kind of hedging product. There had been hedging products before the new options came along. For example, foreign exchange hedging products had existed for centuries, and corporate treasurers had used them extensively. There had also been a wide range of insurance policies, and corporate treasurers had bought those to protect their companies.

Corporate treasurers as a group were slow to take advantage of the new options. They faced restrictions and had to wait until new hedging products appeared. The success of the Chicago Board of Trade options showed that there is demand for new hedging products, and financial institutions began to offer innovative products. The result has been called the Derivatives Revolution.

The term *derivative* is a catch-all that includes options, futures contracts, and swaps. All these products have some common elements, despite having evolved separately. They all protect against one risk or another. In that sense they are all like specialized insurance policies that pay off when some specific event occurs. A company can buy them individually or in combinations, or it can sell one and use the proceeds to buy another. As these products began to appear in large numbers and variations, corporate treasurers had a complicated but potentially rewarding task. They had to choose which ones to use, and

they had to keep reviewing the ones they were using, and replacing some of the ones that expired. The name of the task is risk management.

Companies that are good at risk management show steady growth despite the volatility of the industry sectors they operate in. They use risk management products to smooth the ups and downs of the underlying commodity cycles. In that fashion they deliver stable, growing returns to shareholders. Among investors there is always a strong demand for shares that do not fluctuate violently, but instead rise steadily, with few bumps along the way. The companies that are able to deliver that performance succeed, and their shares rise in the market. The companies quickly gain leadership status and often are able to raise enough capital to buy their competitors. Stock market performance gives them the advantage they need to acquire dominance in their industry sector.

A Simple Application of the Standard Model

Showing the Shareholder Value Criterion

We have shown how the Standard Model of Finance came into existence, as each of its pillars appeared and achieved widespread success. Now we can look at a business decision and see how the Standard Model guides corporate financial managers to the correct decision.

Suppose there is a petrochemical company that processes crude oil and makes it into several different plastics. The company is known for the high quality of its products and is successful. It sells to more than 175 different customers, and no customer accounts for more than 2 percent of its annual sales, so in that sense it is stable. It does not rise or fall with any industry sector because its customers are in many different industries.

The petrochemical company's capital structure is optimal. Its management confers frequently with investment bankers, and as market sentiment changes, the company tailors each new issue of securities to stay in step with what the market wants. The company sometimes buys back its common shares and sometimes uses the shares it has bought back to pay for an acquisition.

Despite the quality of its products and its other advantages, the petrochemical company's share price is not very high. Its earnings are too volatile, and its capacity to pay dividends is too low. The company operates in a mature industry, and investors see that it should have the capacity to generate steady earnings. They also see that it does not deliver stable performance, so they buy its shares only at times when the shares are relatively cheap. The company's earnings are unstable because the price of crude oil fluctuates, and the company is not able to raise the prices of the plastics it sells every time the price of crude rises. The company tries to hedge its exposure to the fluctuations in the price of crude, but its hedging is not very successful. The company

is underhedged, so its earnings fluctuate too much.

Now suppose there is an opportunity to buy a company that has oil wells. These are good wells, with many years of reserves, and they are located near the company's petrochemical plants. From a strategic point of view, buying the oil company looks like a good decision. The petrochemical company would integrate vertically, and its cost of crude oil would no longer fluctuate. The petrochemical company would buy 100 percent of the shares of the oil company and then consolidate the oil company's accounts into its own. The petrochemical company's balance sheet would then show its original assets and liabilities together with the assets and liabilities of the oil company.

The acquisition might be a bad idea from a financial point of view. To see how financial considerations could block this acquisition that sounds so logical from a strategic point of view, suppose the oil company owed \$900 million. Also suppose that its equity is worth only \$100 million. To complete the beginning assumptions, suppose the petrochemical company owed \$500 million, and its equity was worth \$500 million. Also suppose the petrochemical company would issue new shares in exchange for 100 percent of the shares of the oil company. Before the merger, the petrochemical company has 10 million shares issued and outstanding, and its shares are trading at \$50 a share. It would issue 2 million new shares and give those to the owners of the oil company, so after the merger there would be 12 million shares outstanding.

The petrochemical company's stock price would probably go down as soon as it announced the transaction. This is normal because investors would be able to see that 2 million new shares are going to come into existence, so they would be wary of buying until they have seen whether the owners of the oil company decide to keep the shares of the oil company or sell them.

The big question the Standard Model can answer is whether the shares of the petrochemical company would rise in the weeks and months following the merger.

In this case the shares probably would not rise back to \$50; instead, they might fall. The reason is that after the merger the petrochemical company would owe too much money. It would owe the \$500 million it owed before the merger, and it would also owe the \$900 million the oil company owed. To complete the merger, the petrochemical company would have had to assume the oil company's debt. Its consolidated debt position would be \$1.4 billion. If market participants considered that amount of debt prudent for the consolidated company, the market value of its equity would be \$600 million. If market participants felt the consolidated company would be safer and more profitable after the merger, the market value of its equity could be greater than \$600 million. Its stock price could rise above \$50 a share in the months following the merger.

The more likely outcome, however, is that market participants would feel \$1.4 billion is too much debt for the consolidated company to bear prudently. In that case they would be wary of buying the shares, so the shares would fall on the announcement of the merger and not rise later. They might fall to \$40 a share and not rise until the consolidated company had paid back enough of the debt that its debt burden once again looked prudent.

The calculations to determine ahead of time whether the merger would raise the petrochemical company's stock price or lower it are quite simple. The data inputs needed are also simple to obtain. Any junior analyst can quickly get the data and do these calculations.

What does the Standard Model suggest the petrochemical company should do if the merger would lower its stock price? The answer is the petrochemical company should improve its hedging. It can purchase a cap. This is a contract that puts a ceiling on the price the petrochemical company pays for crude oil. For example, if the petrochemical company buys a five-year cap with a price ceiling of \$25 a barrel, and the price of crude oil rises above \$25 a barrel, the counterparty that issued the cap will have to pay the excess over \$25 a barrel to the petrochemical company. If the price of crude oil rises to \$28 a barrel,

the counterparty would have to pay \$3 a barrel to the petrochemical company. Caps are now easy to buy, and there are several major financial houses that offer them.

This example shows that financial considerations now influence whether deals are done, and it shows that the main consideration is the effect of the deal on stock prices. The example also shows that new risk management products have appeared in the market. These new products meet the needs for hedging that are now greater because old-fashioned strategies, such as vertical integration, are not always helpful, since shareholders do not tolerate volatility.

John C. Edmunds teaches finance at Babson College, where he has been faculty advisor to the Babson College Fund, chairman of the Finance Faculty, director of the Stephen D. Cutler Investment Management Center, and research director of the Institute for Latin American Business Studies. He also teaches at the Arthur D. Little School of Management.

Before 1993, Dr. Edmunds was professor of capital markets at Instituto de Empresa in Madrid, Spain, where he was the first holder of a chair funded by Asesores Bursatiles, a leading Spanish securities firm. He has taught at other schools in the Boston area, including Boston University, the Fletcher School of Law and Diplomacy at Tufts University, Harvard University, and Northeastern University. He has also taught at INCAE in Costa Rica and La Universidad Catolica Madre y Maestra in the Dominican Republic and two universities in Chile. At Arthur D. Little, he was voted Professor of the Year in 1994. He has lived in six countries and spent 18 years abroad. His international experience is in Latin America and Europe, and he has also worked in Asia and Africa. He is fluent in Spanish and also speaks French.

*Dr. Edmunds's areas of interest are capital markets, international finance, derivatives, and emerging markets. He is the author of over 70 articles and cases, published in both academic and practitioner journals. His most recent publications are *Brave New Wealthy World* (Prentice-Hall); *Wealth by Association*, with John Marthinsen (Quorum*

Books); “El Valor Escondido de America Latina,” in America Economia, July 2002; The Wealthy World (John Wiley and Sons, 2001); “The Euro: Seafarer on Tides of ‘Stateless’ Money,” in the February 2000 issue of The European Management Journal; “Yankee Doodle’s Mercantile Soufflé: Can Blighty Copy the Recipe?” in the March 1999 issue of New Economy; and “A Market-Driven Reformulation of Multi-national Capital Budgeting” in the June 1999 issue of The European Management Journal.

Dr. Edmunds holds a DBA in International Business from Harvard Business School, an MBA in Finance and Quantitative Methods with honors from Boston University, an MA in Economics from Northeastern University, and an AB in Economics cum laude from Harvard College. He has consulted with the Harvard Institute for International Development, the Rockefeller Foundation, Stanford Research Institute, and numerous private companies.

Chapter 2: Portfolio Performance Basics: Still Vital After All These Years

Anjan Thakor

University of Michigan Business School
Chairman, Finance Department

Key Concepts in Finance

From an investing standpoint, there are a few concepts that are critical to remember:

- First is diversification and the way assets are priced on the capital market. You don't get rewarded for taking risks that are diversifiable. This means that from a risk and return standpoint, you are much better off holding a diversified portfolio.
- The second thing to remember is that more often than not, there is no free lunch. The market is pretty efficient at eliminating arbitrage opportunities. If something looks too good, it probably is too good to be true.
- Third, there is a positive relationship between risk and return. You can always get higher returns if you are willing to take more risks. But risk is a double-edged sword, so you can also lose more.
- The fourth thing is that how much risk you are willing to take is really a function of what your time horizon is. Typically, if your time horizon for liquidating portfolios is short, then you want to take less risky portfolio positions than if your time horizon is longer. If you want to be rewarded for taking risks, then you need to have a fairly long time horizon. In the financial market, when it comes to risks, *long* really means longer than ten years. If you need to liquidate in less than ten years, then that is something that could affect your portfolio position. You want to stay away from less liquid and more risky assets and move more into less risky and more liquid assets.

We typically distinguish among assets on two dimensions. They are related, but they are distinct concepts. One is risk and the other is liquidity. If you look at the risk dimension in traded assets, the riskiest

assets would be options. The next riskiest category of assets would be small-firm stocks, then large-firm stocks, and then bonds. Bonds have different ratings, ranging from junk bonds, which are the riskiest kind of bonds, to government Treasuries, which are the safest kind of bonds.

Along the liquidity spectrum, there is a whole variety of assets, as well. Real estate is very illiquid, especially if it is undeveloped real estate. Stock is very liquid because there is an active secondary market if the company is publicly traded. If it's a privately held firm, obviously that is a less liquid stock. Typically, the more liquid a stock, the lower the risk is that when you need to sell it, you will be forced to sell it at some fire-sale price.

There is a dimension of risk associated with liquidity, as well. Because of the ability to buy and sell, as opposed to an inherent risk-return tradeoff, liquid assets, just like more risky assets, typically deliver a higher rate of return. If you have a very long time horizon, dispose of assets in a timely manner. You may want to hold some liquid assets in your portfolio to take advantage of the higher rate of return. Historically, there is a hierarchy if you want to hold a portfolio for a long time. Among stocks and bonds, the hierarchy is that small-firm stocks yield the highest expected rates of return. Large-firm stocks come second, and then bonds come third. The lowest rate of return over the long haul is with Treasury instruments. They are the most liquid and the safest. As you are putting your portfolio together, this is the hierarchy of instruments from which to choose. There must be the right balance between liquidity and return and the right balance between risk and return.

Another useful lesson to remember is that historically, the difference between the rate of return on a diversified portfolio of equities and long-term government bonds has been about 7 percent. If you hold a diversified portfolio of stock for a long period of time, on average per year you will earn about 7 percent more than you would get if you invested in long-term Treasury bonds. Let's say that the rate of return

on Treasuries is 5 percent, and let's say you were to invest in the market. You should expect about 12 percent, given the risk. Looking at the 1990s, when investors were getting 20 percent to 25 percent per year, we should have expected that it wasn't going to last forever. In a sense, we are now paying back for getting such high returns in the 1990s. Eventually the market returns to its long-run equilibrium. The good news in that is that once we pay back, then we have better times to look forward to.

The formula for the positive relationship between risk and return is called the Capital Asset Pricing Model. The Capital Asset Pricing Model basically tells you what the expected return on a stock should be, given its beta, or its systematic risk. If you are going to be a portfolio investor or if you are going to be in the market, that is something you should know. The formula says that the expected return on any stock is the long-term government bond rate plus the stock's risk, which is the beta, times this market-risk premium of 7 percent that I mentioned. If my risk-free long-term government bond rate is 5 percent, and I have a stock that is one-and-a-half times as risky as the market, then the expected return on that stock would be one-and-a-half times 7, which is 10.5, plus the 5 percent risk-free rate, or 15.5 percent. This is the rate of return I would need on the stock to invest in it.

There is a relationship between the return you can get on fixed-income instruments and the maturity of the fixed-income instruments. That relationship is called a yield curve. The yield curve basically says that for any maturity there is a rate of return that you can get by investing in that instrument at that maturity. If you invest in longer-maturity instruments, you get a higher rate of return than if you invest in shorter-maturity instruments. If you were to put your money in three-year Treasury bonds, you would get more money than if you put your money in three-month Treasury bills. You are being compensated for investing in an instrument that is more volatile and riskier. The longer the maturity, the greater the price risk of maturity. If you are putting a portfolio together as an investor, you have to understand that you can

typically get a higher return by investing in longer-maturity instruments, but you are taking more risk if you don't plan to hold the instrument all the way through to maturity.

There are also some important lessons on options. If you don't thoroughly understand options, the best thing to do is to stay away from that market if you are a retail investor. Options are extremely risky. Unlike with stocks, you don't have the opportunity to be patient once the option expires. The last lesson, related to options, is that options written on more risky stocks typically have more value. As the risk of the stock on which the option was written increases, the value of the option goes up. If you are looking for options with a lot of upside potential, you want to buy them in companies whose stock is very risky, which is the exact opposite of the way we normally think about value and risk. Risk is typically bad for stocks, but it is typically good for options.

Often-Forgotten Rules

One of the rules often forgotten is that of no arbitrage, or no free lunch. People often get carried away. When the market is going up, they assume everything has changed and fundamentals are no longer important. They forget that over the long run of a hundred years, on average the market gives you 12 percent to 13 percent and not 25 percent. To expect it to keep giving you 25 percent is to assume that suddenly all the rules by which the market behaves have changed, and that is not reasonable.

Another lesson that people often forget is how important diversification is. Those investors who rely on their 401(k) plan are extremely undiversified. They are single-stock plans. I don't care how good your company is; if you are not diversified, you are exposed to a lot of risk.

In banking, one of the things that led to the savings and loan crisis (where taxpayers lost over \$100 billion) was that the notion of interest rate risks, which is so fundamental to banking, was somehow forgotten because many of these savings and loan associations were making money by taking a lot of interest rate risk – by borrowing via retail deposits and one-year CDs and investing the money in 30-year mortgages. If the yield curve is sloping upward and the interest rates are higher for longer-maturity instruments, you don't need a lot of intelligence to make money by borrowing short and lending long. The whole notion of interest rate risk is that interest rates don't always stay the same. Sometimes interest rates flip, and short rates are higher than long rates. When that happens, you have a huge problem: You start losing money.

In banking, I think one of the most important lessons for financial institutions has been the importance of managing interest rate risk and keeping that risk within prudent bounds. The same rules of diversification, such as having a diversified portfolio and controlling interest rate risk, are absolutely critical when you lend. The role of capital is also important; if you are a bank, having a sufficient amount of capital is

very important for your long-run survival and financial health.

In corporate finance, the simple rule is that if you don't invest in positive net present value projects that create wealth for shareholders, in the long run you will drive your company into the ground. The other lesson in corporate finance is that you can never overlook the importance of how people will behave in response to any sort of system you set up. Behavior within all organizations is largely driven by performance metrics and the explicit/implicit reward system you set up for employees. Having the right compensation design and using the right metrics to judge projects and people have a lot to do with whether the projects you invest in will create value for shareholders.

Fundamentals of Finance

Finance is, broadly, about two things: one is what happens to decisions within firms in terms of how much value they create – decisions regarding corporate governance, capital budgeting, and investment; the other is how the capital market reacts to these decisions and how risk gets priced in the market.

In terms of what happens within the firm, the basic principles to remember are that if you want to use finance to create value, the first thing you need is a good strategy. The second thing you need is a good internal resource allocation system so that capital is flowing to the highest-value project. The third thing you need is the right performance metrics with which to judge people so that you maximize shareholder value on a day-to-day basis. Finally, you need the right corporate culture within the organization to make sure the implicit rules by which people are being judged and rewarded make sense.

From the external perspective, capital will flow to the highest-value user. The firms that will be valued more highly are the ones that are making positive net present value investments. The market will demand a higher risk premium for investing in firms that are riskier. If you are an investor and you hold a diversified portfolio, you don't really have to care so much about what is happening in the firm because the capital market at an aggregate level is taking care of allocating resources to the best users. You have to make sure you hold a diversified portfolio so that if one out of the 200 firms in your portfolio disappoints, the whole portfolio doesn't go down.

Anjan Thakor holds the Edward J. Frey Professorship of Banking and Finance and is currently chairman of the Finance Department at the University of Michigan Business School. Before joining the University of Michigan Business School, he served as the NBD Professor of Finance and Chairman of the Finance Department at the School of Business at Indiana University. Professor Thakor has also served on the faculties of Northwestern University and UCLA as a visiting professor.

Professor Thakor designs and teaches courses in the PhD and MBA programs and at the Business School's Executive Education Center. His executive education courses include Corporate Financial Management, and Mergers, Acquisitions and Divestitures. Professor Thakor's research and teaching interests focus on corporate finance and banking.

In addition to his many published articles, monographs, and book chapters, Professor Thakor has written three books: Becoming a Better Value Creator: How to Improve Your Company's Bottom Line ... And Your Own (Jossey-Bass Publishers, 2000), The Value Sphere: Secrets of Creating and Retaining Shareholder Wealth (VIA Press, 2000), and Contemporary Financial Intermediation (Dryden Press, 1994). He currently serves as managing editor of Journal of Financial Intermediation and associate editor of Journal of Banking and Finance, and Financial Management. He has served on the Nominating Committee for the Nobel Prize in Economics since 1993.

Professor Thakor is actively involved in corporate consultancy, including extensive work in corporate finance and banking. He has helped various types of organizations, including numerous Fortune 500 firms, navigate the complexities of financing, capital investment, and performance evaluation for strategic decision-making. Clients include Whirlpool Corporation, Allison Engine Co., Citigroup, RR Donnelley, Dana Corporation, Anheuser-Busch, Zenith Corporation, Lincoln National Corporation, J.P. Morgan, Landscape Structures, Inc., CIGNA, Borg-Warner Automotive, Waxman Industries, Reuters, The Limited, Ryder Integrated Logistics, AT&T, and CH2M Hill.

Chapter 3: Practical Approaches to Finance in Business And Education

Maclyn L. Clouse

Reiman School of Finance,
University of Denver
Director and Professor

Rules of Finance

The field of finance deals with allocating scarce resources, and people should always view financial decision-making with a clear sense of fiduciary responsibility, recognizing that they are using the funds they have acquired from someone to do something. They always need to keep in mind that they should make the best possible use of those dollars, taking into consideration the finance issues, as well as ethical considerations, stakeholder concerns, and so on.

We make decisions on an incremental basis. That is, we look at the changes and the marginal effects of our decisions. We need to think of all the consequences of our decision-making, including possible impacts that may not appear in our immediate focus.

We must never forget that money has a time value, and the dollars of different time periods are different. In multi-period decisions, we try to draw a timeline that will show all the impacts of the decision and when those impacts will occur. Financial decisions have to be made in the context of other issues besides finance (ethics, regulatory issues, and so on), so every decision must be related to the impact on shareholder value. Notice that I didn't say shareholder value must be maximized, but the impact must be recognized. Shareholder value should not be maximized to the disadvantage of other important stakeholders.

Key Hypotheses and Theories

There's a well-known hypothesis about efficient markets, which I would say is not true – which is why we have thousands of portfolio managers out there telling us they can beat the market. The hypothesis says that by the time you can trade on any publicly available information, the information is already assimilated into stock prices, and you would not be able to make abnormal profits. However, we have good evidence that people can use public information in different ways and that public information isn't communicated equally to everybody, so there are some investors who are able to make more profitable investment decisions.

Theory tells us the best way to value any asset is by looking at the present value of the cash-flow stream it generates. With business valuation, for example, many authors of paperback books advocate short-cut approaches, but most of those short-cut approaches are gross generalizations that over-simplify the valuation process. They have such illogical assumptions that if you step back and look at those assumptions, you would never use that approach in the first place.

Portfolio theory shows that by combining two assets with returns that have a correlation coefficient of less than 1.0, we can create a portfolio that has risk that is less than the weighted average of the risks of the two individual assets. This result is the basis for the recommended diversification that investors always hear from their financial advisors.

The Capital Asset Pricing Model is a theoretically-based model used to empirically estimate the rate of return an investor should expect to earn on a particular asset. This expected return is a function of the financial market conditions, as measured by the return that could be earned on a default risk-free asset and the return on the market in general, and the asset's risk relative to the financial market. While this model has been criticized in the financial literature, it is still the most applicable and most widely used model to calculate these expected returns.

Long ago, the classic economists defined economic profit as the after-tax earnings reported on the income statement less the opportunity cost of the firm's equity capital. This opportunity cost represents the cost to the firm of raising capital via equity. Sometimes too much attention is given to earnings and earnings growth at the expense of a focus on the firm's economic profit. Economic profit is the ultimate measure of the firm's performance because it shows the residual profit after all costs – operating costs, taxes, debt-financing costs, and equity-financing costs – are deducted from the firm's revenues.

Essential Terms

Present value: The basis of all multi-period financial decision-making. Financial analysis has to recognize that dollar amounts occurring in different time periods are not comparable. That is, a dollar received ten years from today is not the same as a dollar received today. The present value, or value today, of the future dollar amount is the relevant number to use when making a financial decision today. The present value calculation is the common denominator that allows us to compare dollars of different time periods.

Financial statements, income statements, balance sheets: Use the accounting terms and definitions to give us the information from which we make our financial decisions. Therefore, we in the world of finance are incredibly concerned that those financial statements be fair and accurate, not fraudulent, not deceptive, not telling us something that isn't true.

Risk and return: The foundation concept of financial decision-making. You must recognize you can't look at one without looking at the other to make a decision when you're choosing among alternative investments.

Capital budgeting: One of the most important applications of the present value concept. In making decisions to allocate capital among competing uses, it helps you do so in a manner that will give you the best return possible relative to the use of that capital.

Cash flow: As we say in finance, cash is king. Understanding what causes your cash flow, understanding what your cash flow is, and understanding how to use that information are essential parts of financial decision-making.

Accounting methods: They have become so complex and so confusing that the average person reading a financial statement can't understand in many cases what's going on. As an example, at the far extreme, unless you were a PhD and an accounting professor, you

would have had no clue what Enron's financial statements were telling you, they were so complex. The accounting profession must do some things to simplify the financial information so the average investor, or any average individual looking at those financial statements, whatever the purpose may be, doesn't have to have a PhD in accounting to understand what that information is telling us.

Capital structure: An important concept that financial research has looked at for years and years and years, and ultimately it seems to come down to weighing many factors that make it almost an individual decision for each firm. The capital structure decision involves the choices of financing sources. What should the liabilities and shareholders' equity part of the balance sheet look like? How much debt financing should be used? What types of debt – bank loans, bonds, privately placed debt? What should be the mix between short-term and long-term debt? How much equity should be used? What types of equity – common stock, preferred stock, retained earnings? There are so many factors involved, so many complexities in that decision, many of which are unique to an individual firm, that we've been unable to generalize and come up with a universal answer as to what the optimal capital structure should be. We know the things that are important, and we know what the firms' managers should look at, but ultimately it becomes a mixture of many, many factors that make that decision a very complex one.

Market efficiency: The theory sounds believable, but when you look at the actual efficiency across the financial markets, they are less efficient than the theory would suggest. Market efficiency, as popularly defined, implies that all public information is quickly and completely assimilated in a common stock's price. Not all relevant public information reaches all investors at the same time or in the same way. Thus, there is still an opportunity for some market participants to trade profitability when they obtain new information. In addition, there is nothing to lead us to believe that all investors have to derive the same conclusions about a stock's value, even if they all had the same information at the same time.

Dividends: Another timely issue. Dividends are becoming increasingly important to investors because they're discovering that some of the promises of capital gains that we saw, especially in the late 1990s, may disappear as quickly as they appeared. If you receive a cash dividend, then that was a tangible return that you received from an investment in stock, so we might see a little more pressure on firms to pay dividends to shareholders.

M&A: An activity that, on many occasions, generates such enthusiasm for the deal that a lot of the basics we teach and talk about in finance about valuation get forgotten. For example, it is very hard to justify the prices that are paid for many firms without making some huge assumptions about the size of the synergistic benefits. Those synergistic benefits would have to be outlandishly large to justify the prices that are paid, and we've seen on many occasions that those synergies just don't happen. But people were so excited about the deal that they just assumed either greater values for the synergies that were going to come about or greater probabilities of synergies even happening.

Options pricing: Where the finance world starts to get away from the basics of day-to-day. Options pricing starts to get pretty sophisticated pretty quickly, and it goes beyond the average individual's understanding of the basics of finance. Everybody should know a bit about some of these things, but we're getting to some quite specialized information when we look at options pricing models.

International finance: An area people need to know more about. Business finance is becoming increasingly global, so an understanding of the interactions of the financial markets and an understanding of the financial implications of doing business internationally are becoming more and more important as the world becomes financially smaller and more intertwined.

Valuation approaches: Various methodologies for valuing an asset or a firm. There are no rules as to which approach you have to use; you can go to a negotiating table having used any methodology you want. Theoretically, we would argue in the world of finance that the best ap-

proach is a free cash-flow model where we look at the cash flows that will be generated and discount those back to the present using an appropriate discount rate; however, there are other approaches, some of which have more academic validity than others, and some of which have no academic validity. What makes the whole valuation process and the negotiation process involving buying or selling firms or assets interesting is that there are no rules.

Working capital: A terrible name because it's confusing. In the world of economics, for example, when we talk about capital, the connotation is that it is plant equipment, machinery, and things like that. Working capital, in the world of accounting and finance, is defined as your current assets. It's your cash and the dollars invested in accounts receivable and inventory, so it's your short-term dollars, not dollars invested in long-term assets. You have to understand the management of things like cash, accounts receivable, and inventory – the things that change every day for a firm. Another important concept that sometimes gets lost is that even though our income statement may say we've generated a large profit, that profit will never turn into cash unless we collect our receivables, and just because the accountant has told us we've earned a profit doesn't mean we have any cash. Cash won't happen unless we collect the receivables, and sometimes there is not enough effort spent on the collection of receivables.

Changes Affecting the Finance Environment

Clearly one of the things that have had an impact on the finance environment is technology, and it's done that in a number of different ways. Technology and the computer have given us the skills to do a lot more in-depth analysis. In the pre-computer days, we had to spend so much time calculating that we didn't have the ability to spend our time analyzing. And frequently, if we had to do a lot of calculations, the last thing we wanted to do after we'd been calculating for hours and hours was to take a look at what we'd just done and analyze it. Now we can let the computer do the calculating for us so that we can do the analysis.

Generating pro forma financial statements is an example. In forecasting, we can now do all sorts of sensitivity tests in which we look at what would happen under different sets of assumptions. In the old days that would have required hours of calculation; now it just requires changing one assumption in our computer model and pushing the button, and then we see what the results would look like. So we can identify the areas where our results might be very sensitive to changes in our assumptions, and we can identify areas where we may want to focus more of our efforts to change some of the assumptions to get the desired results. That is one way technology has really had an impact on the world of finance. It has allowed us to do better and more in-depth analysis than we could do before.

The other thing that technology has done is provide us with far more information than we've ever had before to help us make financial decisions. That's especially true within the investment community, where we now have the ability to access much more timely information about firms, industries, and financial markets. We can now get up-to-date information and many more information sources than we ever had – and presumably, because we now have better and timelier information, we can make better decisions.

An important issue regarding information is that we've chosen to be fi-

nance people rather than accountants. That is, we didn't want to be the people who were gathering and presenting the information; we wanted to be the people who were analyzing the information. Now, what's scary with recent events is that if we have tainted information coming out of the firm and from the firm's accountants, then no matter how good a job we do in analyzing and using that information to make decisions, if we're basing it on bad numbers, then we're not going to get the good results we want. So if we can't rely on the accounting statements to give us credible information, then we may have to go back and get the information ourselves, and that makes us accountants— which was what we didn't want to be in the first place. So there's always the concern that the information we're using for financial analysis is good information. That's been around since even before the recent scandals.

Finance Education

As we teach finance, we too often want to teach the things that are a lot more fun and high powered – like capital budgeting and capital structure decisions. Many of the students who go through our finance classes will never get to the point where they'll get to make capital budgeting and capital structure decisions, but they may be in positions where every day they're affected by the cash that comes into and goes out of an organization. They may have to make decisions about allowing trade credit and about the credit terms to customers. They may have to make decisions that will affect their inventory and their short-term credit lines, and on a day-to-day basis everything they're doing affects these accounts. Sometimes it doesn't make any difference how good your long-term decision is if you don't have your working capital under control in the short term.

What the finance profession needs to remember as we develop finance curricula and teach our finance students is that in some cases it may be better to do less but do it in greater depth, and to make sure our students have a working knowledge of the concepts. Most of our introductory finance textbooks cover such complex topics as financial statements, the analysis of financial statements, risk and return, capital budgeting and capital structure, and some mergers and acquisitions, and they'll get into international finance and restructuring and bankruptcy. When we remember the majority of students in our courses are not going to be finance majors, then at the introductory level we should probably be trying to do a smaller amount but in more depth, in more detail, and trying to get a strong working knowledge for the student who may take only this one finance class in his or her life. Now, we can do all sorts of things with finance majors in subsequent courses, but at the introductory level I think, in general, our profession has tried to do too much, and we end up doing a superficial job. We are not giving the students the strong foundations necessary to understand finance in their own business or in the business in which they work.

It's interesting that a lot of the basic foundation theories of finance still rely on some of the early work that came out by pioneers in economics and finance. We still rely on many of their theoretical concepts. The difference is that now we apply them in a much more complex world than existed when the theories originally were developed. It's not too often that we see new theories. What we see are new ways to try to apply and use, in a much more complex world, the theories that have been with us for a long time.

Another thing that's exciting about the world of finance is that it's so dynamic. If I were to teach an introductory finance class every quarter – quarter after quarter after quarter – even though I'm trying to teach many of the same skill sets, the world in which we're teaching is changing so much that the stories that go along with those skill sets change. That's one of the things that make teaching finance fun: So many things are going on that the situation is always dynamic, and each quarter is a whole new experience and challenge.

Dr. Maclyn Clouse is director and professor of Finance at the Reiman School of Finance at the University of Denver's Daniels College of Business. Dr. Clouse's primary areas of teaching are corporate finance, investments, and investment banking. He is responsible for the content and delivery of the finance courses in the Executive MBA program and also teaches the Marsico Investment Fund class, a class in which Daniels students actively manage a portion of the University's endowment. For many years, he directed the College's Small Business Institute, which matched students with businesses to provide assistance in all aspects of small business.

Dr. Clouse has developed and presented customized financial management seminars for corporations such as US WEST, the Manville Corporation, Contel-IPC, Diner's Club, Coast RV, Northern Indiana Public Service Company, Toshiba, Kaiser Permanente, Vail Associates, New Century Energies, Galileo, and First Data Corporation. On many occasions, Dr. Clouse has been certified as an expert witness in court cases involving the valuation of businesses, small business

management, and economic loss determination.

Dr. Clouse has a BA from Willamette University and an MBA and a PhD from the University of Washington.

Chapter 4: Understanding the Implications of Market Efficiency

Laurence Booth

J.L. Rotman School of Business
University of Toronto
CIT Chair in Structured Finance

Finance Basics

There are many fundamental propositions in finance, but some are simply corollaries; that is, they follow directly from others. I will take as the fundamental that markets are in some sense “efficient” or “rational” and examine what this means for different areas of finance. We have to remember that most of finance revolves around financial markets and that these markets reflect the actions of many market participants – both buying and selling securities. In some sense it inevitably follows that market prices reflect the information of all of these participants in the market, so in a general sense these prices should be trusted. For example, one of the basic phrases in finance that summarize this idea is “*Listen to the market.*” Even if you don't agree with it, market prices still provide information, and you should know what that information is.

Academics have developed a huge literature around the concept of market efficiency, which at its weakest assumes that all publicly available information is already reflected in security prices. Consequently, there is no value to buying shares based on past share price movements (momentum trading) or doing fundamental financial analysis using the firm's financial statements. I'm not convinced that markets are as efficient with information as financial theory indicates for two reasons.

First, we have securities commissions, who constantly prosecute people for manipulation of security prices. If the markets were as efficient as some advocate, then it would not be possible to manipulate prices, so the mere existence of the SEC is a sobering reminder of potential market inefficiencies. Second, Enron and WorldCom have reminded us that financial statements can be misleading and that the auditors are not always to be trusted. The auditors are supposed to be the gatekeepers who make sure all material information is divulged to the markets. The “disappearance” of Arthur Andersen and the allegation that Andersen actively colluded to help Enron misstate their financial

statements (by the use of special purpose vehicles) have heightened everyone's awareness of the importance of transparency: All material information has to be divulged in a timely and informative manner.

However, the fact that the validity of market efficiency has been questioned should not blind us to its implications. In markets where all material information has been divulged and there is no inside information, market prices are more informative than in markets where the opposite is true. Consequently, I will first deal with four implications of market efficiency where the assumption that all available information is reflected in market prices is robust.

One obvious area where the capital market is likely to possess all available information is in the pricing of fixed income securities, particularly government securities. In most modern economies the central bank is legally as well as functionally separated from the government's Treasury, that is, the branch that manages the government's issue of securities. Consequently there is very little "inside information" as to where interest rates are likely to go. In fact, every statement of the Governor of the Federal Reserve System is scrutinized in detail to see whether there is some indication of what the Fed is likely to do. In the face of such intense scrutiny, it is difficult to believe anyone has inside information as to the path of future interest rates.

The second key point and the first corollary to market efficiency is to understand the term structure of interest rates – to understand that interest rates differ according to different maturities, so the interest rate on treasury bills is different from the interest rate on 10-year bonds and the interest rate on 30-year treasuries. So we can look at the term structure of interest rates and work out where the market expects interest rates to go.

We can do this by working out what are called break-even, or forward, rates. For example, suppose the rate on a one-year government bond was 5 percent and that on a two-year bond 6 percent. Since on the two-year bond you will earn 1 percent more than on the one-year bond, to break even the investor has to catch up by reinvesting the

proceeds from the one-year bond at a 1 percent higher rate next year, that is, at 7 percent. In this case, earning 5 percent from the one-year bond and then expecting to earn 7 percent from reinvesting in a one year bond next year will earn the same return as investing for 6 percent for two years.^[1]

By performing similar break-even calculations for bonds with maturity dates for three, four, five years, and so on, it is possible to calculate the break-even rates for all future time periods. The theorem of unbiased expectations then allows us to use this as the market's forecast of future interest rates.

I am often asked how you judge the quality of a forecast. The answer is you have to compare it to something, and the obvious answer is to compare it with this market forecast. Suppose, for example, you're convinced that market interest rates are going up. Does this mean you should invest in one-year bonds at 5 percent and wait for interest rates to go up just as you forecast? The answer is no. As I just showed by calculating the breakeven rate of 7 percent, we have a benchmark to judge the forecast against. If you think interest rates are going up to 8 percent, then invest for one year, and if you are right, you can rollover at this higher rate and be ahead of the return on the two-year bond. On the other hand if you think interest rates are only going up to 6 percent, then buy the two-year bond: Obviously two years at 6 percent is better than a year at 5 percent and then a year at 6 percent.

These break-even rates also allow us to judge how good economic forecasters are. It is not enough to estimate that one-year interest rates will go up from 5 percent to 7 percent; that forecast is free and in every newspaper. A forecaster has to add value by beating this free forecast, which in practice turns out to be very difficult. Once these break-even rates are calculated, the investor can determine whether to buy long- or short-term government bonds and to question whether their views are correct; either way they should listen to the market.

The third key point and second corollary is to understand inflation.

Most outstanding bonds are termed nominal bonds, since their payments are fixed in nominal terms and not in real terms – that is, what they can buy. For example, if you buy a 6 percent five-year U.S. Treasury, the U.S. government will pay you \$30 every six months for five years and then give you your \$1,000 back at maturity. These payments are fixed contractual obligations of the U.S. government, regardless of what happens to inflation.

If inflation increases and then stays at 6 percent, the real return on this bond is zero: 6 percent nominal interest has been completely offset by 6 percent inflation. In this case, the investor is no better off having invested in this bond than having simply spent their money immediately: Their purchasing power was the same when they bought the bond as it was at the end of the five years. In contrast, if inflation dropped and then stayed at 0 percent, the real return would be 6 percent, and at the end of the five years, the investor's real purchasing power has increased: They can buy more at the end of the five-year period than they could have at the beginning.

Understanding how inflation affects nominal interest rates is very important. The fact that nominal interest rates on long-term U.S. securities are now under 5 percent, compared to the +10 percent levels of ten years ago is due to the lower current inflation rates. However, in contrast to ten years ago, we now have what are called real return bonds (in Canada) or inflation-indexed treasury securities (in the United States). With these bonds, the interest rates are fixed in real terms, and the principal of the bond increases with inflation. In this way, investors are protected from inflation, as every year they earn their fixed rate on a principal amount that increases with inflation.

These inflation-indexed bonds are new securities in the United States, but have existed in Canada, the United Kingdom, and other countries for many years. They are extremely useful for two reasons: First, they remove one of the major concerns of retirees, which is that inflation will reduce the real value of their wealth and render their golden years ones of poverty. More important for our purposes is that they reveal

more information about market expectations. The difference between the interest rate on the nominal and real return bonds is another break-even rate, in this case a break-even inflation rate.

For example, suppose that long-term U.S. government securities offered a 5 percent yield and the real return bond for the same maturity is 2.5 percent. The difference between them, 2.5 percent, is one proxy for the market's inflation forecast. If you felt inflation was going to average only 1 percent over the long term, then it would make sense to buy the 5 percent nominal bond. In that case the real return of 4 percent (5 percent nominal rate minus 1 percent inflation) beats the 2.5 percent real return bond. On the other hand, if you felt inflation was going to average, say, 4 percent, then the inflation indexed bond makes sense, since the real return on the nominal bond is then only 1 percent (5 percent minus 4 percent inflation). In either case you should compare your own inflation forecast with that of the market; that is, listen to the market.

The fourth key point and third implication of market efficiency is to understand the implications of investing in foreign markets. As capital markets become more efficient and barriers to international investing come down, more and more investors look to foreign markets as possible investments. Suppose, for example, one-year U.S. Treasuries are at 5 percent, but the government of Canada is selling one-year Canadian dollar bonds with a 6.0 interest rate, which bonds should the investor buy?

It is tempting to say that obviously 6 percent is better than 5 percent, so buy the Canadian government bonds. The problem is that the payoff of those bonds is in Canadian dollars, and a U.S. investor has to be concerned with the U.S. value of the Canadian dollar in a year's time. If the Canadian dollar depreciates by 5 percent, the extra 1 percent interest is not worth the 5 percent foreign exchange loss. To remove the possibility of foreign exchange gains and losses, the investor could sell the Canadian dollars at a special exchange rate, called the forward rate, thereby locking in a fixed U.S. dollar return.

However, as might be expected, the return from such a strategy, known as covered interest arbitrage, gives essentially the same return as investing in U.S. government securities.

That these covered interest arbitrage strategies in different countries all yield the same return indicates that these forward rates are another set of break-even rates. In this case they are break-even future exchange rates. Just as the term structure of interest rates allows us to estimate where the market expects interest rates to go, in the same way, we can look at a term structure of forward rates as indicative of where the market expects foreign exchange rates to go. Similar to the interest rate forecast, these market foreign exchange rate forecasts are free, except for the cost of a newspaper and the time spent looking in the financial pages: Listen to the market.

The fifth point and fourth implication of market efficiency is to understand credit risk. U.S. government bonds are default-free, since they have a monopoly on the money supply. Despite deregulation in many areas, very few governments have given up their monopoly rights to print money as the legal medium of exchange. However, corporate borrowers have no such access to the money supply. They have to earn the dollars to pay off debt obligations the same as everyone else. Consequently, there is default or credit risk attached to corporate bonds.

We can look at the amount of default risk attached to corporate bonds by looking at the yields, or market interest rates, on lower-quality corporate bonds and comparing them to the yields on U.S. Treasuries. This yield spread reflects the default risk attached to corporations and both the likelihood of the company defaulting and the expected payout should the firm default. By tracking this yield spread through time, we get the market's indication of the likelihood of corporate bankruptcies.

For example, at the top of the business cycle when the economy is booming, most firms are profitable and can survive; this is just a variation on Ronald Reagan's "Rising tide raises all boats." In this case, there is relatively little risk attached to corporate debt, and we tend to

see default spreads narrow as investors become convinced that good times will continue. On the other hand, once the economy starts to slow, corporate profitability starts to decline, and competition becomes more acute. In this case, default spreads start to widen as investors sell corporate bonds due to their higher default risk, forcing up the yield or market interest rate on corporate debt. A “flight to quality” always happens during a slowdown, and the severity of its effects can be seen in the default spread.

By understanding how credit risk varies with the business cycle, we can understand how the market rates the probability of a firm’s defaulting on its obligations. By looking at the aggregate data, we get an indication of the short-run severity of a recession or boom. This information is particularly useful when combined with the interest rate data indicating where the market expects interest rates to go. Want to know where we are in the business cycle? Listen to the market.

In terms of what the capital market can tell us, there are clear messages. The term structure of interest rates tells us where interest rates are expected to go. The interest rate difference between real return and nominal bonds tells us where the capital market thinks inflation will go. The forward foreign exchange rate tells us where the foreign exchange rate is likely to go. Finally, the spread between corporate and government bonds tells us where the market thinks default risk is going and gives a good indicator of where we are in the business cycle.

When we put these four implications of market efficiency together, the capital market tells us where some key variables – interest rates, foreign exchange rates, inflation, and the credit risk in the economy – are expected to go. This provides useful information on the state of the capital market and the real economy.

For example, when macroeconomic forecasters tell us where they think interest rates or exchange rates or inflation are going, we can always compare those forecasts with the free information in the capital market. Depending on where people think those four variables will go,

they can then take positions in terms of inflation, long versus short bonds, high-quality versus low-quality bonds, and foreign currency versus domestic bonds. In each case there is a large amount of information in the prices in the fixed-income market that allows investors to benchmark their own views against those of the capital market. The capital market is not always right, but it always pays to listen to the market. However, in terms of equity markets, the same view – trust and listen to the markets – leads into a discussion of just how efficient the stock market is.

Point number six is essentially the same as point number one, that equity markets are efficient in the sense that it is incredibly difficult to make money in the stock market by following simple trading strategies using publicly available information. Financial research has demonstrated many times that simple rules do not deliver superior returns, especially once the transactions costs of constant trading are taken into account. Some rules appear to have some merit and work for a while, and then they stop working and deliver stunning losses. For example, in the late 1990s momentum trading was all the rage, as the stock market was in a long-run bull market. However, none of the momentum rules picked up the peak of the market and stung many investors as the market turned into a three-year bear.

I tend to believe that the equity markets, like the bond market, are efficient in the sense that there is no easy money to be made and that prices are set by many reasonably sophisticated investors constantly searching out relevant information. However, does this mean that, like the bond market, there are corollaries in terms of interesting information we can glean from these prices? Here I think that the answers are not so obvious.

Point number seven is that even though the equity markets are efficient, that doesn't mean they're also rational. We have to understand that there is an enormous amount of noise in the equity market, and share prices are affected by many more factors than bond prices. It is very difficult to pick stocks consistently to beat the market, but that

doesn't mean that those equity prices are set rationally. It is a conundrum that although it is well known that in an efficient market, asset prices fluctuate randomly, this can also happen in an inefficient market: Randomness *per se* or, alternatively, the difficulty of beating the market, doesn't in and of itself prove market efficiency.

The basic problem is that sometimes we get bubbles in the stock market. Some academics will go through amazing contortions, rather than face the obvious truth that security prices are set by individuals operating in capital markets and that individuals both individually and collectively sometimes make mistakes, huge mistakes. The central problem is that it is incredibly difficult to form a correct valuation of the equity market. Unlike the bond market, where prices always revert to the bond's principal value at maturity, there is no "anchor" for equity market values. As a result, equity values can drift off from fundamentals for a long period of time without any certainty of a short-term reversion to their "true" values. So even though the prices are still set in an "efficient" market, and it is difficult to make money, it is not necessarily true that the prices reflect the underlying fundamentals.

To some extent the foregoing remarks are time-dependent and reflect the run-up in the Internet and technology stocks in the late 1990s and their subsequent collapse. With hindsight it is clear that prices were considerably in excess of fundamentals and that the equity market wasn't rational. However, it was still extremely difficult to take advantage of these opportunities in terms of making money by speculating against the market. Why this is the case has been one of the most controversial topics in finance for the last hundred plus years. This is partly because we have had bubbles in stock markets going back to the Amsterdam tulip mania and the South Seas Company bubble in England in 1720, where famously Sir Isaac Newton lost his fortune and declared, "I can calculate the motions of the heavenly bodies, but not the madness of people."

Classically trained economists tend to believe that speculation offsets bubbles, so that they can't exist. If prices get above the fundamentals,

then shrewd speculators step in and sell to reap huge profits when prices revert to their fundamental values. If this were true, we would have expected to see professionals selling at the top of the stock market bubble. However, it turns out that this was not the case. Those who should know the most about the value of their companies, the companies themselves, repurchased a record amount of stock in 2000^[2] right at the top of the market!

In 1936 John Maynard Keynes pointed out that professional investors do not speculate in the manner described in classical economics. As he argued:

They [professional investors] are concerned, not with what an investment is really worth to a man who buys it “for keeps,” but with what the market will value it at, under the influence of mass psychology, three months or a year hence.

Keynes himself was a very successful speculator, as well as the most brilliant economist of the 20th century, and was under no illusions as to how financial markets worked. However, even he would have wondered at some of the implications of the Internet bubble. Michael Lewis, the author of *Liar's Poker*, pointed out that an Internet company, NetJ.com, had filed statements with the Securities and Exchange Commission with the confession, “The company is not currently engaged in any substantial activity and has no plans to engage in any such activity in the foreseeable future.” The company had \$127,631 in accumulated losses and so little money on hand that the directors would have had to chip in themselves to pay any filing costs to raise capital. The only snag was NetJ.com had a market capitalization of \$22.9 million!

It is difficult to see how a company with nothing, promising to do nothing, could be worth \$22.9 million. In Spring 2000 it was a tough job explaining market efficiency, let alone rationality. This leads to point number eight. The equity market may be broadly efficient, but that does not mean equity prices are accurate signals of the fundamentals

in the economy. This is what is meant by allocational and productive efficiency.

Ideally, high profits in any sector of the economy indicate high consumer demand and the need for firms to produce more. This is the heart of a free-enterprise, competitive economy with the equity market at the heart of this process. High profits end up being capitalized into equity prices, with prices increasing above book value, so that high market-to-book ratios indicate that new investment and production are needed. But what of the Internet bubble? The signals given in the late 1990s were that Internet companies, like E-Toys were really valuable; [3] consequently, broadband communication companies, like World-Com, were valuable and so, too, the equipment makers, such as Cisco and Lucent. The extremely high valuation on these technology stocks provided the signal to the real economy to expand production in those areas.

Unfortunately, those valuations were not the result of high profits: Consumers had not indicated they were demanding or willing to pay large amounts of money for broadband connections and Internet services. The stock market valuations were not based on financial projections, but a “new age of investing,” and it turns out that those signals were hopelessly wrong. We now have a glut of production in most technology areas and large numbers of bankruptcies. In terms of the signal that the equity market gives to managers, we have to remember that it is a very noisy signal. Unlike the fixed income market, it doesn’t always pay to listen to the equity market. [4]

Point number nine is another corollary of potential equity market deviations from fundamentals, which is that executive stock options are not the panacea that finance people have been claiming in terms of executive compensation. The basic assumption justifying executive stock option grants is that they motivate managers to act like stockholders, and further that managers can, by their actions, influence the value of the firm.

In the late 1990s, during the bubble in Internet and technology stocks, it was quite clear that it wasn't the actions of the managers that were influencing stock prices. The economic fundamentals of these sectors were overwhelmed by the stock market bubble in prices. As a result, managers at many of the Internet and technology companies were actively exaggerating and fermenting the bubble in their stock prices. For many Internet startups, the first senior appointment was not in finance or marketing, but in public relations, to keep a stream of information coming to the market to hype the stock price.

Clearly, there has to be a realignment of the value of executive stock options as a compensation tool. We can't just allow firms to award executive stock options and not include their cost in the financial statements. For many firms this practice vastly understates the true cost of their operations and distorts both the labor market and the stock market. Further, the practice of lowering the exercise price when the stock price goes down, so that the executive is guaranteed to exercise sooner or later, removes any coincidence of interests with stockholders, who have no such opportunities.

Finally, point number ten is that corporate financial policy isn't as important as corporate investment policy. Whatever the firm is doing in terms of its financing – in terms of its debt-equity ratio and of its dividend policy – is of relatively minor importance compared to the fundamentals of actually producing profitable products. This is the classic proposition that earned Professors Franco Modigliani and Merton Miller the Nobel Prize. I would guess that the performance of Enron and the use of special-purpose vehicles has brought home to people that financial chicanery can *transfer* value, sometimes huge amounts of value, from one group to another, but it does not *create* value.

The fundamental is that real value has to be created by real productive activities – by producing things and by being competitive. The capital market is really of minor importance compared to the fact that production managers and marketing managers and strategic managers actually produce things of value for the corporation and us as

consumers.

[1] For simplicity I ignore compounding and some technical issues in calculating the correct interest rates.

[2] S&P 500 companies repurchased shares worth \$152 billion in 2000 compared to cash dividends of only \$137 billion.

[3] E-Toys was worth \$10.1 billion, even though in its bankruptcy barely eighteen months later it realized only \$20 million.

[4] As Keynes once said, “The stock market has predicted five of the last three recessions...”

Key Terms

Present value is the current value to an individual of the stream of cash flows generated by a particular security. It is essentially a personal value reflecting the time and risk value of money to an individual or corporation. When the resulting present value is estimated and compared to the cost of the security or investment, it determines whether the security of investment should be bought or sold.

Financial statements are balance sheets, income statements, and cash flow statements prepared by the firm to reflect its operations.

Return is the rate of return received on an asset – the percentage increase or decrease in value received from an investment. The risk of the investment is the uncertainty attached to receiving that rate of return; that is, risk is the probability of unfortunate events occurring so that you don't earn the rate of return you expect.

Capital structure is the firm's choice between debt and equity financing and its choice between short- versus long-term debt. It is the choice a firm makes in its long-term financing.

Dividend is the decision the firm makes on how much of its cash it retains within the firm to reinvest and how much it distributes to stockholders. The cash can either be distributed as a cash dividend or be used to repurchase the firm's stock.

Mergers and acquisitions together are the decision a firm makes to either buy the assets owned by another corporation – which is an acquisition – or combine its operations with those of another firm – a merger. As well as referring to acquiring assets, M&A more generally refers to corporate restructuring, including the spinning off or sale of assets the firm no longer needs and changes in the form of corporate organization.

The Option Pricing Theory is the pricing of underlying securities where the payoff, or what you receive, depends upon certain events occur-

ring. The classic example is a call option where you have the right, but not the obligation, to buy shares at a fixed “exercise” price. If the price goes above the exercise price, you buy; if it stays below it, you throw away your option. Option Pricing Theory received a huge boost when Fischer Black and Myron Scholes developed the Black-Scholes model to value options. The ideas have been extended to a whole series of other types of options.

International finance is the extension of standard finance problems to cover foreign securities or foreign corporations. For example, it is the implication of exchange rates for domestic corporations involved in the trade, purchase, and management of foreign assets; it is the acquisition and divestiture of foreign corporations; and the asset allocation decision as to what proportion of foreign securities to hold in a portfolio.

The simplest test of *market efficiency* is whether or not you can make money in the stock market by using simple decision rules and publicly available data. For example, believers in the “dogs of the Dow” theory trust that you can outperform the stock market by buying the ten stocks in the Dow with the largest dividend yields. Efficient market theory would argue that this cannot happen. There are more rigid interpretations of efficient markets, but the simplest one is: “Can you use publicly available information to outperform a simple buy-and-hold strategy of holding bonds and equities?”

Risk-return tradeoff is the pricing of risk in the capital market. We know equities are riskier than bonds, but how much extra can we expect to earn on equities given this riskiness? Historically the answer is about 5 percent, which is the standard estimate of the market risk premium.

Default risk is the risk of non-performance on financial contracts. This risk exists with any financial contract except those issued by the Federal government, which are termed default-free. Default risk is rated by the major credit rating agencies, such as Standard and Poors (S&P): AAA, the highest, down to D for in default. Professionals have

to be able to understand the pricing of credit risk because so many contracts are not with AAA credits or with the government; they are with people where there is a risk of nonperformance. So credit risk, particularly at a stage when we have a slow economy recovering from recession, is a very important factor in most personal investment decisions.

A term of obvious importance is *time value of money*, which is the most basic concept in finance, but it consistently confuses people, even some in the finance business. The fact is that the value of a dollar in five years' time is not equivalent to the value of a dollar today, since it is always possible to invest a dollar today to get more than a dollar in five years. Many misrepresentations are due to failing to understand or report fully the implications of the time value of money. For example, a few years back people were taken to court for misrepresenting the value of Florida land. The deal seemed excellent – you spent \$10,000 for a piece of land in Florida, and also got a \$10,000 bond backed by the U.S. government. This was marketed as a “risk-free” investment. What the ads forgot to mention was that the land was largely under water, and so essentially worthless, and the \$10,000 bond didn't pay off for 25 years. The present value of the bond was a few thousand dollars, so people paid \$10,000 for something actually worth a few thousand dollars – in practice, just throwing \$7,000 or \$8,000 away. Tricks played with time value of money in terms of discounting are still the fundamentals of finance.

Essential Formulas

Sometimes in reading finance textbooks it appears that there is an equation to solve every finance problem. However, equations in finance are not like those in physics or engineering: Sometimes they work and sometimes they don't! Frequently in finance the formulas are based on highly simplifying assumptions, which means they are not as reliable as those in engineering or physics. Just because the formulas involve equations and look precise does not mean they are all equally useful.

For example, the time value of money works, and the formula for valuing bonds works. In general fixed income equations work, so whenever we value bonds, we discount all the interest payments, and the value of the bond at maturity using the following formula:

$$V = \sum_{t=1}^T \frac{INT}{(1+k)^t} + \frac{Principal}{(1+k)^T}$$

where the interest (INT) from time period 1 until the maturity of the bond at time period T is discounted back to the present and added to the present value of the bond's principal value.

Nobody would value a bond using anything other than the above bond valuation equation. It is hard-wired into many calculators and as a function in many spreadsheets. In the same way, we have formulas for other fixed-income securities, such as financial leases, mortgages, and annuities, and just like the bond formulas, they all work. They are all routine and very accurate calculations.

We also have another set of equations or formulas that work. These stem from the Black-Scholes option pricing equation. These formulas have been a major success story in finance, since they value some of the most complicated financial securities ever designed. Although they

are very complicated, they work because they are all derivatives, which is to say they price these securities based on another traded security. Call options, where you have the right to buy something, and put options, where you have the right to sell something, both at a fixed price, are the two simplest forms of derivatives. However, all these options are derivatives on the underlying stock, and the problem is that we can't value these underlying stocks – the equities – very well.

For equities we have lots of formulas for the simple reason that none of them work very well. However, the problem is not the formulas, but the assumptions that go into the formula. For example, the most basic equity valuation formula is the Gordon growth model. This is as follows: This states that the value of a share is the expected dividend per share (d_1) divided by the discount rate (K) minus the long-run expected growth in the dividend per share (g).

But how do we value non-dividend paying shares like Microsoft? Moreover, note that high growth stocks where, $g > k$, end up having negative values, which obviously makes no sense. The reason for the latter result is that the Gordon model assumes that dividends grow at this long-run growth rate (g) to infinity. It is then logically impossible for a stock's dividend to grow faster than the discount rate forever, since the overall growth rate of the economy is constrained to be below the risk-free rate, let alone the discount rate. Consequently, having $g > k$ or even close to it implies an infinitely long growth rate incompatible with the overall growth in the economy.^[5]

One way of getting around the above problems with the Gordon model is to assume that $g > k$ for some time period, say five years, and then growth slows to another rate. This is the so-called two-stage or finite-growth model. It handles the interesting case

$$P = \frac{d_1}{K-g}$$

where a firm can grow much faster than others, but eventually it faces a growth constraint imposed on the fact that as it gets bigger it becomes increasingly more difficult to maintain an above average growth rate.

We also have sophisticated formulas for determining the discount rate, mostly derived from risk-based asset pricing models. The most famous is the Capital Asset Pricing Model or CAPM:

$$K = R_F + MRP * \beta$$

where the discount rate is composed of a time premium based on the risk free rate (R_F), and a risk premium, which is the product of the market price of risk and the firm's beta coefficient (β). I mentioned before that the market price of risk in the United States is about 5 percent; the time premium is just the yield on the relevant long U.S. Treasury bond, so that all that is needed is the relative risk of the security, which is what the beta coefficient measures. In practice there are a variety of statistical ways of estimating beta, as well as services that provide current beta estimates.

However, the problem is not so much estimating the discount rate as the future cash flows to an equity security. For established companies, cash flows can be estimated with some precision, so pricing problems, while they still exist, are at least manageable.

The problem comes in venture capital and emerging lines of business where there are no profits, frequently no cash flows, and sometimes no sales. For such businesses the valuations are highly unreliable and subject to extreme errors, as the dot-com bubble indicated.^[6]

Many look at the precision of all these finance formulas and assume that they are all equally useful, without realizing that the formulas are all based on different assumptions and that they are only as good as the data fed into them. Here the GIGO adage – garbage in, garbage out – is as valid today as it ever has been.

So there are a variety of formulas in finance. The most accurate are the fixed-income and derivative formulas for valuing bonds, annuities, loans, and options, and the most inaccurate are the equity valuation formulas, which is why when we value equities we still use price-to-earnings ratios, price-to-book ratios, and enterprise-value-to-sales ratios. These shortcuts perform just as well as most of the equity valuation models. The reason for this is simply that using discounted cash flow models, such as the two-stage growth model, requires considerable insight into the business of the firms and the future economic conditions. For many inexperienced users, using short cuts like the PE ratio is likely to involve fewer valuation errors.

[5]The problem is that the formula is based on a geometric series that has to converge, but if $g > k$ the series does not converge.

[6]Fortune once tried to value dot-coms by “eyeballs” – how many eyeballs visited a site. However, it’s a long stretch from having visits to a Web site to the site generating cash.

Financial Analysis and Forecasting

The most important type of financial analysis is basic ratio analysis. Every financial executive has to have a very good understanding of accounting. This is where some academic finance programs have fallen down: Collectively we have de-emphasized accounting and have emphasized economics. As Enron has reminded us, financial executives and financial academics have to have a very good understanding of accounting, both for corporate finance and for what is needed in value equity shares. The most important aspects of security analysis and of corporate finance are to understand financial analysis, which is to go through the basic Dupont formulas to understand where the profitability of a firm comes from, and then further to read the notes to the financial statements.

Generally, there is too much functional fixation on earnings per share, and not enough time is spent reading the notes to the financial statements to understand the quality of the underlying information that goes into the earnings per share calculation. Financial analysis is overwhelmingly the most important thing – apart from the time value of money – that people get out of a finance course. Financial analysis is what finance professionals need to know. Unfortunately, it is not being emphasized as much it should be in most finance textbooks.

It is critically important to be able to read a set of financial statements and realize that the earnings per share have increased simply because the company triggered the sale of an unwanted asset, rather than through increased sales; or that the sales themselves were made only through generous financing indicated by the increase in accounts receivable; or that the increased earnings per share only came about because the firm hid some expenses either through using executive stock options instead of bonuses as compensation or by stretching out depreciation schedules. WorldCom has alerted us all again that changing expenses into assets not only reduces expenses and thus increases earnings per share, but also increases the tangible asset value per share.

After financial analysis, you need to go through basic financial forecasting. Financial analysis tells us what has happened, but good financial forecasting can tip us off as to what might happen in the future. Here it is important to check cash flow from operations with net income to assess the quality of a firm's financial statements. Profitability shortfalls that have been covered through triggering asset sales or stretching out depreciation schedules become apparent in a five-year forecast as the firm's ability to generate cash flow dries up.

The great value of financial forecasting is in the ability to build a spreadsheet model and do "what if" analysis. We can do this in spreadsheets very easily. What tends to happen is that professionals vary the sales levels by plus or minus 2 or 3 percent. They change the cost of goods sold or the fixed cost and then assess the impact on cash flow and earnings. The hidden flaw in much of this analysis is a failure to understand the linkages between different spreadsheet variables. There is too much extrapolation, simply because spreadsheets allow you to extrapolate, and not enough smart modeling.

The key idea that has been rediscovered in finance is what is now called real options. The insights of Black and Scholes into pricing derivatives have been very important, but their insights have also reemphasized that in any spreadsheet, you can't simply extrapolate numbers. You have to consider that if certain numbers change significantly – say, sales increase by 5 or 10 or 15 percent – then there may be other changes that are going on, as well. For example, the increase in sales may cause scale economies to lower unit costs or increase the gross margin. Similarly, if sales decline by 5 or 10 or 15 percent, the firm may change some of its actions and actually change the underlying cash flows. This is actually an old message in finance. We used to talk about it in terms of decision trees. For example, a price decline of 20 percent may cause the gross margin to turn negative, forcing the firm to close that line of business to avoid incurring more losses. Similarly, a price increase may cause the firm to switch production from one line to another. In either case, a simple extrapolation in a spreadsheet doesn't fully capture the dynamism of the firm's response to cer-

tain situations. The incorporation of the idea of real options into spreadsheet design offers the benefit of more accurate and realistic financial forecasting.

Mergers and Acquisitions

The basic message in mergers and acquisitions is that most M&A destroys value. We look at the data over and over again, and most acquisitions simply don't pay off. Yet corporations still consistently make large-scale acquisitions. Trying to persuade senior executives not to pay 30 percent to 40 percent premiums to buy other companies is extremely difficult, but we know from all of the evidence gathered over the last 20 to 30 years that it is extremely difficult to generate enough extra profits out of the acquired company's assets to pay for the 30 percent to 40 percent acquisition premium required to buy the company.

However, there are some rules about what types of acquisitions are more likely to make sense. Basically, big companies buying small companies in the same line of business, acting very quickly to remove unwanted senior management, integrating as quickly as possible, and creating teams to make sure the acquisition strategy still makes sense after the purchase is made – these things are key for successful acquisitions. Generally they are the rules for industry roll-ups or consolidations within the same business.

That type of successful M&A generally has a small immediate impact on the firm, since it is generally part of an ongoing strategy. The type of M&A that generally doesn't make sense is the “one-off” blockbuster deal between dissimilar companies made in the name of synergy, that somehow one plus one equals three. In these cases, cultural differences make it difficult to integrate the two companies; there are often management succession problems, and the synergies usually fail to materialize. Yet it is these blockbuster deals that grab the headlines, since they offer a chief executive officer the chance of turning a moribund company around. What were the supposed synergies between a Marathon Oil and a US Steel or an AOL and a Time-Warner?

The fact is that to justify a 30 percent to 40 percent takeover premium, the profitability of the target's assets has to increase significantly, ce-

teris paribus, by 30 percent to 40 percent, just to break even. In a roll up this can be achieved simply by removing the fixed costs of the target and consolidating production, although in two equally sized but disparate businesses, this is not possible. However, persuading a senior executive that an acquisition doesn't make sense is difficult, particularly when everyone else involved, from the lawyers to the investment bankers, has a vested interest in generating fees from cutting a deal!

Effects of the Business Cycle on Perceptions

What we think is important varies with our personal circumstances and the stage of the business cycle. If you talked to people three years ago – when the stock market was booming and everybody was raising money to buy dot-coms that were going to be our saviors and that were going to change everything we do in a spirit of euphoria and optimism and hope – then many would have given very different ideas about the importance of finance. Capital markets were then critical for raising money for junior companies, and transforming the economy.

However, we are now living with the implications of the excesses of the 1990s. As people have seen their personal portfolios dwindle over the last two years, they are more pessimistic about what is actually going on in equity markets. Three years ago, probably most finance people would have said that markets are efficient, period. I think what we can say now is that bond markets are efficient. We have a good handle on pricing bonds. We have a good handle on pricing derivatives. But we don't have a good handle on pricing equities. Not only do we not have a good handle on pricing equities, but the information we use coming out of the financial statements is unreliable – it is clear that there was a lot more fraudulent activity going on and misrepresentation of data than most people expected.

This is why standard financial analysis is critically important – which is what people have forgotten. They got used to taking financial statements at face value. Enron demonstrated vividly just how far away from reality those financial statements could be, as did WorldCom. Further, they got used to letting financial analysts do their thinking for them and got a rude awakening when they realized, after the fact, that many analysts fudged their reports to generate investment banking fees and, between peers, admitted their reports were junk. In such an environment a return to the basics of due diligence and financial analysis and an understanding of stock prices in terms of the earning power of the company, rather than one-time-only financial gimmickry and stories, are the order of the day.

Many of these remarks simply reflect the impact of the recession. Whenever the economy slows, the stock market crashes, and investors get burned, we see a similar reaction. It happened in the early 1990s and early 1980s and the early 1970s, and it will happen again in about another ten years. Much of the learning, of what we think we know and what we don't know, depends on the general state of the economy and the capital markets. Before the next crash, we will have a recovery and boom, and most of the hard learned lessons will be forgotten as they invariably are. A new set of investors will again believe financial statements and financial analysts and that the good times will continue forever, but history and common sense indicate this will not happen.

Professor Laurence Booth is the CIT Chair in Structured Finance and the Finance Area Coordinator at the J. L. Rotman School of Management at the University of Toronto. He completed his undergraduate work at the London School of Economics, and his masters and doctorate in finance at Indiana University. At the University of Toronto since 1978, he has taught graduate courses in business finance, international financial management, corporate financing, mergers and acquisitions, financial management, and financial theory, as well as short executive programs on the money and foreign exchange markets, business valuation, mergers and acquisitions, and financial strategy. He has been voted the second-year MBA instructor of the year at Rotman in three out of the last five years.

Dr. Booth's research activity is primarily in domestic and international corporate finance, where he has published extensively in leading academic journals on cost of capital, corporate financing issues, and risk management. He is an active researcher and is on the editorial board of four major journals, including the finance editorship of the Canadian Journal of Administrative Sciences. His advice is frequently sought by the media, and he has appeared as an expert financial witness before the Ontario Securities Commission, the National Energy Board, the Canadian Radio-television and Telecommunications Commission, and most of the major provincial regulatory tribunals in Canada.

Chapter 5: Lessons From Market Efficiency

Deborah J. Lucas

Kellogg Graduate School of Management, Northwestern University

Donald C. Clark Household International Chair of Finance

Market Efficiency

The idea of market efficiency is a cornerstone of modern financial theory and the foundation for much of what will be emphasized throughout this essay. Yet in times like these, when markets are turbulent and investor confidence has weakened, some people tend to dismiss market efficiency too easily. So it is natural to begin with a reminder about what efficient market theory does and does not imply, and make the case for its continued relevance.

Simply put, an efficient market is one in which information – good or bad – is quickly reflected in the market prices of financial securities. Prices represent the current consensus about fair value. This is not to say that prices at every moment are right in any absolute sense; the theory simply implies that most people cannot identify the direction or duration of any error. The idea is compelling because it follows directly from the observation that when many smart people try to exploit any new information as it hits the market, their trades tend to push prices to a level that is hard to second guess. Investors competing to exploit profit opportunities ensure that few such opportunities exist. Market efficiency therefore serves as a caution to investors not to expect a free lunch.

The theory of market efficiency is commonly divided into three distinct hypotheses: strong form market efficiency, semi-strong form market efficiency, and weak form market efficiency. The type of information assumed to be reflected in market prices distinguishes between these theories.

Strong form efficiency says you can't make money by simply studying the history of prices – current prices already reflect any information that could be inferred from price histories. Semi-strong form efficiency goes further and states that all public information, such as company press releases, accounting numbers, and macroeconomic data, is fully reflected in current prices. Advocates of either weak or semi-strong

form market efficiency concede, however, that insiders and other people with private information may be able to profit from their informational advantage. The strong form hypothesis pushes the idea of efficiency to the limit. It says that all information, even private information, is reflected in market prices. The idea is that insiders, in the process of trading to exploit their informational advantage, quickly reveal what they know through the effect of their trades on prices. The weight of empirical evidence supports weak and semi-strong form efficiency – the idea that public information is quickly reflected in prices; this is what I mean when I speak of market efficiency here.

Market Efficiency and Personal Investment Strategies

When markets are unusually volatile, it is easy to believe that normal rules no longer apply, and that almost anything could happen. Some people trade heavily in an attempt to time the market or to bet on individual stock price movements. Fearing large losses, other people pull out of the market entirely. However, if markets are efficient, either response is likely to be ill-advised. Excessive trading will surely generate high trading costs, but is unlikely to produce offsetting gains. Adopting too conservative an investment strategy will leave you with little risk, but a commensurately low rate of return (although, as discussed below, in the face of a stock market bubble, reducing risk exposure may be prudent).

Some market observers strongly reject the notion of market efficiency – they are attuned to the psychology and idiosyncrasies of the market and are convinced there is money to be made. While I believe a few talented individuals may have the ability to spot emerging patterns and exploit them effectively, the weight of several decades of empirical research supports the idea that markets are reasonably efficient. From the perspective of individual investors, perhaps the most important evidence comes from the studies on mutual fund performance.

If it were possible to regularly exploit pricing mistakes, mutual fund managers, whose job is to look for under-priced assets, should be able to beat a passive investment strategy, such as investing in the S&P 500 stock index. As it turns out, on average, mutual funds under-perform passive index strategies by a significant margin when fees and other transaction costs are taken into account. Active managers trading frequently under-perform relative to passive managers avoiding excessive trading costs. Load funds under-perform relative to no-load funds, meaning investors who pay more for help don't get more in return. Still, one might wonder, even if the average financial manager cannot generate value, why not invest with a financial manager who can? Unfortunately, finding a manager who can consistently beat the

market is as difficult as beating the market on your own. Market efficiency applies to managers, as well as to markets. Competition for the services of any manager capable of generating above market returns should leave the manager, not investors, with any excess profits.

In an efficient market the best investment strategy for most people is to hold a well-diversified portfolio, tailored to reflect individual risk tolerance, tax status, liquidity needs, etc. (As explained below, diversification usually guarantees the lowest possible risk for any target level of return.) Since competitive forces mean prices are about right, then you do not need to spend long hours analyzing investment alternatives, and there is no reason to pay an expert for trading tips. An efficient market allows investors the luxury of being lazy. It is important however, to occasionally reevaluate whether your portfolio reflects your risk tolerance, whether it is optimized for your tax status, and so forth. For many investors the advice of investment professionals is helpful in evaluating these alternatives.

A largely passive approach to personal investing strikes many people as counterintuitive. Business professionals know that careful analysis is critical to making sound investment decisions.

But there is no contradiction here. While the burden falls on individual managers to evaluate business investments, for publicly traded securities the opinions, and often careful research, of a much larger group of investors are already reflected in asset prices. This greatly reduces the value of gathering additional information and frees investors from the need to do so when market prices are available.

Two Caveats

Even though this viewpoint seems to place me squarely in the market efficiency camp, I would like to add two important caveats. The first concerns investing in the presence of asset price bubbles. The second concerns the best investment policy for investors who are forced to hold under-diversified portfolios.

In the face of a stock market bubble like the technology bubble in the late 1990s, some efficient-markets proponents would argue that investors should not alter their investment strategies one bit. After all, even if prices appear too high to explain, other investors are also aware of this. Expected returns are still positive because otherwise investors would sell. There is no telling when the bubble will burst. On the other hand, a second cornerstone of financial theory is that stock prices (like the prices of all financial assets) are ultimately tied to fundamentals, that is, to cash flows. If prices are many times higher than any reasonable expectation of future cash flow can justify, this suggests investors are taking a much greater risk than in normal times. Investing in a bubble is a bet that someone will come along and buy a share of stock from you at a price that is even further out of line with fundamentals than the one you paid. This cannot continue indefinitely; the resources of the real economy ultimately limit the value of the market. Eventually market participants must come to their senses and prices must return to earth. It is reasonable, then, for investors with a limited taste for risk to sit out bubbles, shifting their money to less speculative investments. (Readers interested in further exploring this viewpoint are directed to the writings of Professor Robert Shiller of Yale University.)

For many investors diversifying is simple. It involves investing in a broad-based stock index fund and other asset classes, such as real estate and bonds, with the portion devoted to each asset class reflecting an individual's taste for risk. For some investors, such as top executives and owners of small businesses, the optimal diversification strategy is not so straightforward. In the last few years my colleague,

John Heaton at the University of Chicago, and I have been studying the question: Is standard portfolio theory an appropriate prescription for investors who are forced to invest heavily in their own companies? Typically, corporate executives receive company stock and stock options as part of their compensation package. This provides an added incentive for managers to act in the interest of shareholders. Small business owners similarly hold a substantial portion of their wealth in their own companies. A cost of this practice is that entrepreneurs and managers are exposed to considerable risk with few outlets for diversification.

If you have no choice but to invest heavily in your own company, as is the case for many wealthy people and even some workers, placing your unrestricted savings in the market portfolio is unlikely to maximize the benefits of diversification. There is the potential of further reducing your risk by judiciously choosing investments that will tend to perform well when your company is faltering. This is consistent with the basic logic of diversification that certain risks tend to be offsetting.

Consider an executive at General Motors who is heavily exposed to GM risk. Not only does her job depend on the fortunes of GM, but she also holds a large portion of wealth in GM stock and options. If she also invests her unrestricted savings in a diversified stock portfolio, it will include the stocks of Ford, GM, Chrysler, and other car companies. This increases her overexposure to auto industry risk. A well-structured diversifying portfolio would avoid investments in the auto industry or might even involve taking a short (*i.e.*, negative) position in the stock of other automobile manufacturers. Similar considerations apply to employees forced to hold retirement savings in the form of own-company stock. Those workers not only face the undiversified risk of losing their jobs, but they also risk simultaneously losing their retirement savings. A sad but not uncommon example is the case of Enron, where employees find themselves with no jobs and little or no savings. Diversification for workers means holding their savings in portfolios that avoid own-company stock.

These examples lead to the conclusion that many people could further reduce their risk exposure by thinking about what diversification means in their personal situations. Taking this approach, one would generally start with a diversified market portfolio and then add or subtract particular stocks so as to hedge the risks from restricted stock holdings or job loss. While sophisticated investment managers already employ such strategies on behalf of high-end clients, I am optimistic that a broader awareness of this issue will eventually be used to help a much broader group of investors.

Market Efficiency, Risk, and Return

In an efficient market, security prices adjust so that expected return is commensurate with risk. Investors bid up the prices of low-risk assets and bid down the prices of high-risk assets. Market efficiency therefore implies that if you spot an asset with an extraordinarily high expected return for its asset category, it probably carries an extraordinarily high degree of risk. If, for instance, you invest in a corporate bond with a high quoted yield, it is almost surely more risky than an average corporate bond. Even though United Airlines had an investment grade rating less than two years before it declared bankruptcy, the calculated yield on their bonds was among the highest in that rating class.

Investors, anticipating the possibility of default, drove down the price of United's bonds to the point where the risk and expected return were in line.

Another example of the strong tie between risk and return is the experience of a Minneapolis-based money market fund, which for years proudly advertised their record of superior performance. Their success was perplexing: Money market funds, with their strict guidelines for safe investment, generally lack the latitude to significantly outperform their competitors. The puzzle was solved when it was learned, following catastrophic losses, that the manager had hidden derivative investments. Market efficiency implies that investments that look too good to be true probably are.

In determining the relation between risk and required return, financial theory distinguishes between two different types of risk: diversifiable (or idiosyncratic) and market. The theory states that investors will be compensated for market risk, but not for diversifiable risk. Most investments have elements of both types of risk. Market risk arises from common factors, such as business cycle fluctuations, and affects almost all assets to varying degrees. Diversifiable risk is not correlated across assets, and, as its name suggests, it can be eliminated by diversification. It is the nature of diversifiable risks that when one asset

has a higher than expected return, another is likely to have a lower than expected return. Thus those risks cancel out in a diversified portfolio. In contrast, market risk cannot be eliminated by diversification because it affects all assets simultaneously in the same direction.

Finance theory states that investors are compensated only for market risk, not for diversifiable risk. Market efficiency is a key ingredient to this conclusion. The idea is that astute investors recognize that some risks can be diversified, and hence accept these risks without extra compensation as part of a diversified portfolio. These diversified investors bid up the prices of assets with idiosyncratic risk until prices reflect only market risk. As a result, undiversified investors will find themselves bearing idiosyncratic risk without any compensation for it. This line of reasoning also makes clear the importance of diversification. In an efficient market diversification is essential to ensure investors returns commensurate with risk exposure.

Market Efficiency and Valuation

Finance theory offers business managers a variety of powerful tools to help evaluate whether a potential investment will add value. Most notably, these include market prices, discounted present value methods, and options pricing methods. I will focus on the first two, since their underpinnings are in efficient market theory.^[1]

In an efficient market, if relevant market prices are available, they should be a manager's top pick out of the valuation toolbox. Why focus on market prices? Again, it is because they offer a free, broad-based opinion on an asset's value. When managers ignore the information in prices, large and costly mistakes can occur. The most striking evidence is found in the literature on mergers and acquisitions. On average, an acquiring firm pays a substantial premium over the market price for the firm they are acquiring. Analysts prepare page after page of discounted cash flow analysis to justify the high valuations, along with appeals to operating efficiencies or other synergies that would seem to make the target very valuable. But the evidence shows that, on average, acquiring firms overpay and value is destroyed – losses to the stockholders of acquiring firms more than offset the gains to the stockholders of takeover targets. Market prices, it seems, are a better indicator of the value of takeover targets than the detailed studies of investment bankers.

Often market prices are not available, or they are clearly inapplicable to the situation at hand, as in most capital budgeting exercises. In this case the method of discounted present-value analysis is an essential valuation tool that also has its origins in market efficiency. It disciplines investment decisions by forcing managers to carefully assess the likely value added of a prospective investment, and provides a framework to examine key sensitivities. It incorporates the preferences of a company's stockholders via the choice of the discount rate. The technique involves first projecting all future cash flows that are attributable to that project. This includes any indirect costs or benefits, such as the opportunity cost of using a facility that could otherwise be used else-

where or sold. The idea is to set the cash flows to a realistic level, not optimistic and not pessimistic. The appropriate risk-adjusted discount rate also must be identified. A project is deemed worthwhile if the present discounted value of cash flows is positive, and is said to have a positive net present value (NPV). In an efficient market, the estimated NPV represents the best estimate of the effect of the project on firm value.

Even though discounted present value analysis is a relatively straightforward technique in broad outline, applying it effectively can be a challenge. Some people feel that projecting cash flows into the indefinite future involves so much speculation, and that the right discount rate is so uncertain, that the resulting estimates are too imprecise to be useful. The question though, is whether there is a better choice. Certainly it is better to have an imprecise estimate of value than no estimate at all or one that is based on an overly simplistic rule of thumb. In the end all investment decisions are subjective, but numbers help to inform judgment and point to potential flaws in purely intuitive evaluations. Explicitly identifying expected future cash flows allows analysts to test the sensitivity of value estimates to these assumptions. Maybe your best guess is that cash flows will grow at 8 percent per year after ten years, but will the project still be worthwhile if the growth rate is only 6 percent? The only way to tell is to lay out alternative assumptions about cash flows and discount rates, and see whether, over a reasonable range of assumptions, a candidate project still appears to be worthwhile.

Some analysts use multiples as an alternative to present discounted value analysis. The idea is that comparable companies should trade at comparable multiples. If, for instance, most computer manufacturers trade at multiples of 20 times earnings, then a company trading at 25 times earnings would appear to be relatively expensive, unless some additional source of value can be identified. This type of analysis rests on the questionable assumption that companies in similar lines of business are in similar positions with respect to earnings and value. It also skirts the question of whether the general level of prices is rea-

sonable. This problem was made abundantly clear with the crash of Internet stocks. Internet stocks were often evaluated in terms of multiples, in part because it seemed impossible to predict when positive cash flows would actually appear. A discounted present value analysis would have identified the lack of foreseeable cash flows as a red flag, but multiples analysis de-emphasizes this problem by focusing primarily on relative value.

For firms that rely on discounted present value analysis, correctly identifying the cost of capital is critical. It is a major determinant of which projects a company will take on and which it will reject. If the rate-of-return hurdle is set too high, managers will pass up profitable investments. If it is set too low, value-destroying projects will be accepted. There are several important considerations to keep in mind in determining the cost of capital.

The first rule is that a project must be evaluated based on a discount rate that reflects how much market risk is associated with it. For a public company, its diversifiable risk is generally not a concern. This rule for choosing a discount rate follows from market efficiency. As discussed above, in an efficient market, diversified investors, whose concern is primarily with market risk, determine share prices. Managers acting on behalf of diversified investors must therefore evaluate whether the expected return is commensurate with the type of risk investors care about. In practice, market risk is usually quantified using a financial model such as the Capital Asset Pricing Model (CAPM). The model provides an estimate of an investment's "beta," a measure of the amount of market risk. Some managers make these estimates themselves, while others use the services of a financial consultant. The details of the CAPM and related models are beyond the scope of this essay, but a comprehensive discussion can be found in any modern finance text.

A related principle that is too often overlooked is that the relevant market risk is that associated with the project under consideration. This may be very different from the overall risk of the company. The idea is

that the project should be evaluated based on the amount of market risk it contributes to the company at the margin. For instance, if a company that is primarily in the aerospace industry has the opportunity to invest in a supermarket chain, the cost of capital for that project is the one associated with supermarkets, not aerospace. The logic is that investors in an efficient market view companies as a portfolio of all their investments. They therefore require a weighted-average return that reflects the relative importance of each component. If the company consists of 70 percent aerospace, 20 percent electronic components, and 10 percent supermarkets, investors will require a return reflecting the cost of capital for aerospace, electronic components, and supermarkets, with weights of 70 percent, 20 percent, and 10 percent, respectively.

Notice that in describing the determinants of the required rate of return, there has been no mention of how the project is to be financed. This is deliberate. The reason that financing can be neglected is also attributable to market efficiency. Investors in a company's debt and equity require different rates of return because the two types of investments have very different amounts of market risk. Debt, with its first claim on any cash, carries significantly less risk than equity. A firm's assets, however, tie down its total amount of market risk. This total risk is conserved, no matter how it is split between debt and equity. Even though debt holders require a lower return than equity, a firm cannot necessarily lower their required rate of return by issuing more debt. Taking on additional debt makes both the debt and the equity of the firm riskier, increasing the required return on both debt and equity. [2]

Serious mistakes can result when companies fail to take these valuation principles into account. Several years ago, an executive MBA student in Thailand told me that his company was getting loans from its Japanese parent company at a rate close to zero percent. As a result, the management considered its cost of capital to be almost nil, leading them to adopt some very marginal projects. The problem with management's logic was to equate the required return on debt with the

overall required return, neglecting the considerable risk borne by stockholders. Companies that invest in risky projects can never have a cost of capital close to zero, even if they can borrow at a very low rate. If other Japanese companies were similarly underestimating their cost of capital, this may be one source of the continuing problems plaguing the Japanese economy.

[1] Options-based methods rely on the assumption that there are no arbitrage opportunities, but not on the idea that prices reflect available information. This makes options-based methods relatively robust. Unfortunately they are applicable in limited situations.

[2] A complete analysis of the effects of financing would include the tax shields associated with debt financing. The basic point that risk and return arise primarily from the underlying project is true, however, even when the value of tax shields is taken into account.

More Caveats

Standard valuation methods, like standard portfolio advice, rely on the assumption that investors hold well-diversified portfolios. As discussed earlier, small business owners and corporate managers often cannot diversify. This suggests a source of conflict between the managers and shareholders of public companies. It also suggests that small business owners may be justified in assigning a higher price to risk than standard finance theory recommends.

While well-diversified shareholders prefer that managers ignore diversifiable risk in selecting investment projects, managers may behave otherwise because of their high personal exposure to company-specific risk. This can result in too conservative an investment policy that ultimately reduces shareholder value. I mention this to question the conventional wisdom that compensating executives with company stocks and options aligns the interests of shareholders and managers. While both prefer higher stock prices, they may strongly disagree about what types of risk should be avoided.

In the case of small business owners with majority equity stakes, the caveat is that textbook methods to estimate the cost of capital may not lead to the right answer. Models like the CAPM are premised on the idea that companies have well diversified shareholders who don't care about the specific risk of the company. To the extent that companies are closely held, traditional theories are likely to understate the cost of capital by neglecting an important component of risk. Unfortunately, I know of no formula designed to correct this problem. Unless such tools are developed, small business owners will have to rely on the standard theory and subjective judgments in assessing their cost of capital.

Unifying Principle

Most of the major results in academic finance rely on the assumption that markets are reasonably efficient. Since financial theory directly affects practice, it means that most financial decision-makers directly or indirectly rely on the idea of market efficiency. That assumption is reflected in the standard advice of investment advisers, and the standard tools used by businesses to evaluate investment choices.

This realization may be unsettling to people who strongly doubt markets are efficient. But the idea rests on the observation that when many smart people try to exploit any new information as it hits the market, prices tend to reflect an informed consensus about value. It does not say that prices are exactly right, or that everyone acts rationally. Thus I consider market efficiency a unifying principle that makes finance theory more robust, rather than a cause for concern.

Deborah Lucas is the Donald C. Clark Household International Professor of Finance at the Kellogg School of Management at Northwestern University. She joined the Kellogg faculty in 1985 after graduating from the University of Chicago with a PhD in economics. From 1990 to 1991 she was a visiting assistant professor of finance at the Massachusetts Institute of Technology, and from 1992 to 1993 served as a senior staff economist at the President's Council of Economic Advisers in Washington, D.C., focusing on finance and the macro economy. From 1996 to 1998 she was chair of Kellogg's finance department. From 2000 to 2002 she was again in D.C., as the chief economist of the Congressional Budget Office.

Professor Lucas's research is in the areas of dynamic asset pricing and corporate finance. Her focus has been how imperfect diversification and information problems affect asset returns and portfolio allocation decisions. She has published more than 20 papers in leading economics and finance journals, receiving best-paper awards for three of these publications. In the policy area, her published work includes papers on health economics, regulation of financial institutions, and gov-

ernment accounting. She is currently an associate editor of Econometrica and has been an associate editor for the Journal of Money, Credit and Banking, and the Review of Financial Studies. She serves on the Advisory Board of the Federal Reserve Bank of New York and as a director of the American Finance Association.

At Kellogg, Professor Lucas teaches corporate finance and fixed income securities to MBA students and a PhD class in dynamic asset pricing. She has taught banking and capital markets in the executive management program, and she lectures in executive programs on swaps and securitization. She has also taught abroad, at Thailand's Sasin School of Management and as a visiting scholar at the Stockholm School of Economics.

Chapter 6: Valuation—The Essence of Finance

Kenneth Lehn

Katz School of Business, University of Pittsburgh

Samuel A. McCullough Professor of Finance

Basics of Finance

When people think of finance, they often think it's all about number crunching. In fact, however, finance provides managers with a framework for thinking about a whole variety of business issues, including topics in marketing, human resources, operations, and organizational design. The essence of finance is valuation – how you value assets and liabilities, how you create value, how you destroy value, how you measure value, and so forth. Since all business functions contribute to value creation or destruction, the tools of finance provide managers with a way of putting structure on many different types of business problems.

In my opinion, the first principle of finance is that managers should approach all problems with the goal of creating value for investors. Firms compete intensely for the limited pool of capital in the world. The pool might be large, but the demands for capital are even larger. Ultimately capital flows to companies that do the best job of creating value for investors.

Managers often pay lip service to value creation. Most managers would say they are trying to create value for investors, but then they approach their jobs with other goals in mind, such as increasing market share, maximizing return on capital, chasing earnings and earnings growth, and reducing firm risk. All of these goals might be correlated with value creation, but none of them, in and of themselves, creates value for investors. I can show you many examples of companies that successfully pursued these goals and ended up destroying a lot of value in the process. By far, the most important rule for managers is to keep their eyes on the ball and focus on one goal – creating value.

Finance teaches us that you create value for investors by generating returns on invested capital (ROIC) in excess of your cost of capital. The amount of value you create is equal to the difference between ROIC and the cost of capital, times the amount of capital invested in

the enterprise. The amount of value a firm creates is referred to as its “economic profit,” which is different from its accounting profit, or earnings. Economic profit is often referred to as “economic value added,” or “EVA.” EVA is a trademark name coined by Stern Stewart, a consulting firm based in New York. This simple expression provides a very useful way of thinking about a large variety of business problems. It focuses on the way a firm manages its capital, that is, the way it manages the cash investors have entrusted to it.

For example, many managers are driven by the earnings implications of their decisions. But the concept of economic profit makes it clear that earnings alone do not create value. Earnings create value only if they provide a return on capital that compensates investors for the opportunity cost of their capital. This opportunity cost, referred to as the cost of capital, is the return investors expect to earn on their own if, instead of investing in a particular firm, they invest in assets that have risk identical to the firm. Hence, until a firm generates earnings in excess of what is necessary to provide an ROIC higher than the cost of capital, they have not created value for investors.

There are many ways managers can boost earnings that destroy value. For example, one can grow earnings by increasing receivables and inventory substantially. Unless the increase in earnings is sufficient to provide a high enough return to investors for tying up more capital in receivables and inventory, the increase in earnings actually destroys value. Similarly, increasing R&D and capital expenditures represents the use of investor capital. Unless these investment decisions increase earnings sufficiently to compensate investors for the use of their capital, they destroy value.

When considering any use of capital, whether it’s an acquisition, the purchase of a building, an investment in worker training, or so on, managers should always ask: Is this an appropriate use of investor capital? Is this project likely to generate a return for investors that compensates them for the risk of investment? You’d be surprised at the number of managers who don’t ask that question. They might

make an acquisition or acquire inventory because they're trying to grow their market share or grow the firm, but neither of these decisions alone creates value. Any time a manager makes a decision about the use of capital, he or she should ask, "If we gave this capital back to our investors, would they be able to generate a return on their own that is higher than the return we can generate?" If the answer is yes, then the company should give the capital back to investors, rather than invest it.

A second rule for managers is to avoid becoming emotionally attached to your investment projects. Many times managers make investment decisions and become so attached to them that they try to hold them together even when it's obvious they should terminate them. You can see that now with the AOL- Time-Warner merger. AOL stock's price fell dramatically when it announced that it was merging with Time-Warner two years ago. I think it was trading at around \$75 a share before the merger, and it immediately dropped to around \$60 a share after the merger announcement. The market was screaming at AOL to abandon the merger. It went forward, of course, and its stock price has fallen to less than \$15 a share. The elusive synergies that Steve Case of AOL and Gerry Levin of Time-Warner supposedly saw in the merger have never materialized; yet I still see both arguing that the merger was a good idea. It's amazing how managers can rationalize what is obviously a horrendous use of investors' capital.

Third, managers should not see debt as a bad thing and "strong" balance sheets as necessarily good things. Managers often are averse to taking on debt, and you often hear glowing references to companies that have strong balance sheets, that is, balance sheets with little debt. But, again, the avoidance of debt should not be the goal – creating value is the goal. Given the tax and incentive effects of debt, taking on debt can be an important way of creating value. There are countervailing disadvantages of debt, of course, so selecting an optimal debt structure requires an analysis of the costs and benefits of debt, which vary across firms and industries. There's a huge amount of literature on optimal capital structure, but the upshot for managers

is that they should not be unnecessarily averse to using debt.

Fourth, for multi-business firms, which are most publicly traded firms, it is important for capital budgeting purposes to establish different hurdle rates for different businesses. Let's say a company estimates its cost of capital as 10 percent, but it has two divisions, each with very different risk. Maybe one division has little risk and investors expect a return of 8 percent, which is what they can earn on their own by investing in assets with identical risk. Maybe the other division has higher risk and investors require a return of 12 percent. The managers at headquarters should apply different discount rates, or hurdle rates, to projects in the two different businesses based on their risk.

You often see companies like this applying the same discount rate, namely the entire company's cost of capital, to projects in all divisions of the company. This is a very common mistake and one that can destroy a lot of value. In our example, using the company cost of capital would destroy value by turning down too many value-enhancing projects in the low-risk division (*i.e.*, projects generating ROICs of between 8 percent and 10 percent) and accepting too many value-destroying projects in the high-risk division (*i.e.*, projects with ROICs of between 10 percent and 12 percent). The greater the disparity in the risks of a company's units, the more value it will destroy by applying a uniform company cost of capital to all of its divisions.

Fifth, managers of public companies should keep in mind that the market is generally quite efficient. For public companies, stock prices generally reflect all public information about their company, and managers can learn a lot from the level of their stock prices and how their stock prices react to decisions they make. When AOL saw its stock price plummeting after announcing the merger with Time-Warner, they apparently didn't interpret the stock price reaction as a negative signal. You often find managers discounting the information contained in stock prices. In my opinion, managers should generally assume their stock prices are a good barometer of their company's expected future performance and take some cues from the information contained in

the stock prices.

Corporate Finance

Corporate finance focuses on how to manage a firm's assets and liabilities so as to create value for investors. We generally believe that firms that are most efficient in creating value will survive, and those that are not will become extinct during takeover or bankruptcy, so it is up to managers to create value for their organizations.

A major field in corporate finance is capital budgeting, which examines how firms should make decisions to invest capital. All investment decisions have a common feature: In exchange for a certain cost, the investment is expected to generate a stream of uncertain earnings. The dominant tool used in capital budgeting decisions is the net present value rule, or the NPV rule.

The concept of present value recognizes that a dollar tomorrow is worth less than a dollar today. There are three reasons for this.

First, there is a time value of money. For example, if today I loaned you \$100 for a year, I would effectively give up the use of that \$100 for a year. So I would charge you interest to compensate me for deferring my use of that \$100 for a year. This is referred to as the time value of money. It is generally accepted that the time value of money is worth about 3 percent.

Second, a dollar tomorrow is worth less than a dollar today because most of the time the overall price level is expected to be higher tomorrow than it is today. So the purchasing power of a dollar tomorrow is less than the purchasing power of a dollar today if the overall price level increases. When inflation is expected, the rate at which future dollars are discounted includes a premium for inflation expectations. In countries with hyperinflation, such as Brazil 20 years ago, interest rates are enormous because of this inflation expectation. In rare cases where the price level is expected to decline – that is, in deflation, the “inflation” premium in the discount rate is actually negative.

Third, a dollar tomorrow is worth less than a dollar today because a

dollar tomorrow is uncertain, while a dollar today is certain. If I told you that a firm is expected to generate \$100 million in cash flow in five years, but that there is some risk associated with this, you would prefer \$100 million today over a promise to receive the firm's expected cash flows of \$100 million in five years. This is just another way of saying, "A bird in the hand is worth more than a bird in the bush." Consequently, the more uncertain a future dollar is, the higher the rate at which we discount it. This is why the discount rate used to value high risk firms and projects is so high. For example, venture capital firms typically apply discount rates of at least 40 percent to the future cash flows of startup companies, largely to compensate them for the high risk associated with these ventures.

So there are three reasons for discounting expected future dollars: the time value of money, inflation expectations, and risk. A major part of any capital budgeting project is selecting an appropriate discount rate, that is, a rate at which to discount the expected future dollars from a project. Discount rates vary widely across projects and firms. For example, a low risk project in the food industry might have a discount rate of less than 10 percent, while a high-risk project in the biotech industry might have a discount rate of over 20 percent.

To compute the present value of a project, one projects the cash flows that are most likely, and then discounts them by a factor related to the discount rate. Obviously, the quality of this calculation depends on the quality of the assumptions made about expected cash flows and discount rates. Anyone working with the present value model quickly appreciates how sensitive value is to assumptions about future cash flows and discount rates. That's why we should be very skeptical of any one particular present value calculation. A golden rule in doing this type of analysis is to conduct lots of sensitivity analyses.

After calculating the project's present value, its net present value is calculated. The net present value is simply the present value minus the cost of the project. Under the NPV rule, if the net present value is positive, the project should be accepted. If the NPV is negative, the

project should be rejected. Although there are many technical complications associated with the use of the NPV rule, this in essence is how it works. It remains the dominant capital budgeting rule.

The major limitation of the NPV rule is that it ignores the value of managerial flexibility. In projecting cash flows, the NPV approach does not allow managers to ramp up production if cash flows turn out to be better than expected, or to cut back production if cash flows turn out to be worse than expected. In recent years, financial economists have developed a new tool, referred to as “real options,” which is designed to value the value of these so-called flexibility options. The real options approach attempts to apply variants of option pricing models, such as the Black-Scholes model, to capital budgeting decisions. While it is theoretically appealing, as a practical matter, the real options approach is very difficult to apply in most settings, since some of the key variables in the model are usually unobservable. In my opinion, despite its shortcomings, the NPV model, with sensitivity analysis, is still the most reliable approach to capital budgeting.

Professor Kenneth Lehn is the Samuel A. McCullough Professor of Finance in the Katz School of Business at the University of Pittsburgh, where he teaches courses on valuation and corporate restructuring. He joined the faculty at the University of Pittsburgh in 1991 after serving as chief economist of the U.S. Securities and Exchange Commission for four years. Professor Lehn has also taught at Washington University, UCLA, Miami University, and Georgetown University. He has won the MBA Teacher of the Year Award at the University of Pittsburgh many times.

Professor Lehn’s research focuses on topics in corporate finance, including mergers and acquisitions, corporate governance, and capital structure. In addition, he has written on topics relating to the economics of professional sports. He has published in leading academic journals, including the Journal of Financial Economics, Journal of Finance, Journal of Political Economy, American Economic Review, and the Journal of Law and Economics. He has also published several op-ed

pieces in The Wall Street Journal. Professor Lehn is a founding editor of the Journal of Corporate Finance. He has served as a consultant for numerous firms and government agencies, including Procter & Gamble, Lehman Bros., the National Hockey League, the Department of Justice, the SEC, and the Federal Reserve Bank of New York.

Professor Lehn received a BA in economics from Waynesburg College, an MA in economics from Miami University, and a PhD in economics from Washington University.

Chapter 7: Current Issues and Concerns in Finance

Allan E. Young

Syracuse University School of Management
Professor of Finance and Editor in Chief – The Journal of Entrepreneurial Finance
& Business Ventures

The Most Important Thing About Contemporary Finance

The most important thing about finance, if one had to elevate a single concept to the top of the scale, would be the relationship between risks and returns. All financial models that have come into ascendancy – original academic models that are now used in the professional world, as well – deal in terms of the relationship between risks and returns.

However, when financial analysts speak of risks and returns, they often forget about entry and exit mechanisms. People sometimes buy securities and go into other forms of businesses with respect to physical assets without a real understanding of how they'll get out or the costs of doing so. High-level professionals certainly consider that. But sometimes in the euphoria of understanding a prospective business deal, or even equities in emerging markets, people forget about exit mechanisms. With respect to financial assets, these are things that can significantly affect risks and returns.

Particularly if we're speaking of comparing stocks (or even bonds), we usually don't think in terms of buying and selling costs – economists would call these items transaction costs. In effect, entry and exit mechanisms should be added to the risk- return equation. Many financial markets are very, very thin, especially in so-called emerging markets. And so, particularly with respect to institutional investing in these emerging markets, the very buying and selling action of investors can sometimes drive stock prices through their own activities. So while risks and returns are probably the two most important aspects in contemporary finance, and all models deal with these two elements, many of these models forget to explicitly include entry and exit mechanisms in the equations; it is often assumed that entry and exit costs are negligible.

It is also assumed that transaction costs will remain constant throughout, and that is not the case. Particularly in times of crises, even in mature and well developed large capital markets – our capital markets, for example – these entry and exit costs (usually now we’re speaking exclusively of exit costs) – rise precipitously. There was a time during the market crisis of 1987 when NASDAQ dealer-market-makers were reputed to have backed away from investors wishing to liquidate their positions – they simply wouldn’t answer their phones. Dealer-market-makers were required to deal once they picked up their phones, according to NASDAQ rules, so they just wouldn’t answer their phones.

And so these things are not factored into the models, and that makes it difficult to rely on just a notion of risks and returns. It’s actually far more complex than just saying risks and returns are the sole significant aspects of financial concern because there are many aspects of consequence. For example, past volatility, which we usually take as a measure of risk, and some computation of past returns or even a projection of future returns, are normally considered the elements of primary consequence. However, because markets often do not remain constant over time, the risk and return parameters of the past are frequently not accurate predictors of the future.

Valuation is, of course, the key to financial analysis. One could well have said that valuation is the most important aspect of contemporary finance, and valuation is best approached through an effective understanding of risks and returns. Further, valuation can be comprehended from many perspectives. The most common method now employed is the Capital Asset Pricing Model (or CAPM) and other related models. This approach understands the value of a capital asset as a function of the “riskless” return, the market return on financial assets in general, and the degree of risk inherent in any particular financial commitment in relation to the risk of financial assets in general.

Yet, one of the cardinal aspects about finance is that there are no rules, or practically none. There are some mathematical relationships

that will always hold true. If you were to, say, compute rates of return from looking at cash inflows and outflows and you find a 5 percent or 10 percent figure, that's a reasonably hard and fast mathematical relationship that will almost never change. We say "almost" because even here you can have some gimmickry and tricks and complexities. But other than this, basically there are no rules. And probably the single most important rule in finance is that there are no rules that can be relied upon at all times and under all circumstances.

If you look for simplistic answers, you frequently get fooled. It is often rather easy to get fooled if you are uninitiated and unsophisticated in financial matters and look to solve this problem through simplistic answers. Accounting earnings are a very good example of this, and people are finally coming to understand the qualitative nature of accounting earnings.

With accounting earnings, we might use a somewhat complex term to explain what is meant. The concept at issue is epistemology. Epistemology is an understanding of the theory of knowledge and how and in what ways and degrees things are known. In some situations you have a very high degree of accuracy attached to a given dollar figure – for example, printed stock prices on the financial page. The degree of reliability of reported stock prices should be understood in relation to the reliability and accuracy of reported accounting earnings. With respect to reported accounting earnings, some companies apply very conservative, withdrawn, and limited accounting principles to recognize revenue in a very limited way and recognize expenses more rapidly. Other firms do precisely the opposite, recognizing revenue in an expansive fashion, while slowly writing off expenses. In the boom years of the 1990s, many firms (technology firms in particular) engaged in the latter practice of reporting current earnings at as high a level as possible through rapid revenue recognition and delayed expense write-offs. Thus, the reported net income figures of firms using greatly differing accounting principles are inherently dissimilar in a qualitative fashion and simply cannot be compared without adjustment.

Accordingly, we must apply a far lower level of reliability to reported accounting earnings (and the comparability of this figure across different firms using different accounting conventions) than we do to reported stock prices. In essence, there is a significant epistemological difference between these two concepts. And again, there are no rules: Two financial statements can have the same dollar per share of earnings and mean something very, very different in one case versus the other. So it's hard to speak in terms of rules governing financial affairs.

If we had to list ten immutable rules with respect to finance, all ten of them would be, "Be skeptical." Just as they say about real estate, "Location, location, location," we should say, "Be skeptical of what you're told" ten times. Look beneath the simplistic nature of things. There truly are no immutable rules other than obvious mathematical relationships. If you invest a dollar today, and you get two dollars back at the end of ten years, every financial analyst knows that your rate of return is 7.2 percent compounded annually. This financial relationship between inflows and outflows of funds will not change over time. To compute the present value of a financial commitment, once the inflows and outflows of funds on the commitment are known, every financial analyst will get the same answer. This is an unchangeable rule. You put the numbers in the computer and press a button, and everyone will agree as to the outcome. But it's only those kinds of things that are hard and fast rules; everything else is highly changeable. The really important, significant, and interesting issues relate to the inputs (usually the inflows and outflows of funds). Once we can agree on these inputs, we will all get the same answers. But agreement on these inputs is not easy and depends on the many assumptions that are made in any such determination of project cash inflow and outflows.

Nevertheless, there are a few formulas, theories, and hypotheses that have risen to a high level of ascendancy in terms of understanding financial markets. Again, none of these models is believed in the sense of immutability.

CAPM, as noted, is simply a way of relating risks and returns. CAPM

was originally developed as a means of valuing financial assets. However, it has been used less successfully in capital budgeting, which refers to the valuation of real assets.

There is also the Black-Scholes model, which is an options pricing model that has additionally been extended in terms of contingent liabilities and other areas. Black-Scholes has been found to be a very useful model with respect to many valuation problems.

But there have been a number of departures from both of these – the so-called arbitrage pricing theory is one. All of these models are fairly old and well used. There was a time, 20 or 25 years ago, when in the classroom we would use these terms and teach our students these things, and find that in executive development programs in the investment community, they weren't widely used. Now they are. Beta and other measures of risk are as common in the contemporary investment community as blood pressure, PSA, and other measures of physical health are in the doctor's office.

In essence, what were once purely academic models have now risen to the status of general acceptance in the professional business and investment communities, a development of the last 20 or 25 years. Before that time, these academic terms and concepts weren't quite as popular as they now are in the professional world. One of the primary reasons for the adoption of these academic concepts by the professional business community is the trend for students to be trained in the academic world before entering business. The MBA is now virtually a necessary credential for entry at the highest levels into the business community. Executive training programs have become commonplace. And some of the highest-level academics are now going to work in the business world, either as consultants or as employees in some of the biggest Wall Street firms. Many academics have done that – and in so doing have fattened their pocketbooks considerably. But the overall result is a greater closeness over the past quarter century between the academic and professional business worlds.

A concept not yet developed in this chapter that has considerable cur-

rent interest both in academic and professional business circles is the efficient markets hypothesis (EMH). EMH is the notion that information drives stock prices, comes to the market randomly, and is instantaneously impounded in these stock prices. A clear implication of EMH is the disutility of attempting to predict stock price movements. Many studies have tested the validity of EMH, and while some exceptions have been found to this concept, most of these exceptions are to be expected on the basis of institutional characteristics of markets and other such factors. In essence, while some inefficiencies have been found in major markets, such as the United States, this condition is somewhat unusual and rarely represents viable investment opportunities for the individual investor. In general, market inefficiencies are far greater in emerging markets than in developed markets. Yet, anyone who has lived through the last ten years understands that inefficiencies can plague developed capital markets, as well.

A word of caution: All models make assumptions. For example, CAPM assumes no transaction costs, no taxes, and, among other things, the stability of beta over time. You have to understand the assumptions behind these models, and all of them abstract and go into somewhat unrealistic assumptions to make reasonable projections of risk-return relationships. It's not enough just to say, "I know the equation of CAPM." That's easy enough. You actually have to understand what's behind the equations – basically the assumptions on which these equations have been built.

Types of Financial Analysis

There are many types of financial analysis. You can almost call anything having to do with dollars financial analysis; as long as you're dealing with a dollar sign, you're engaging in some form of financial analysis.

A bit of history with respect to the relative emphasis of various forms of financial analysis or accounting statement types through the years might be useful at this point. There has been a very interesting change through the centuries in the focus of financial analysis and the relative importance of the various financial statements. Cash flow analysis was the predominant focus of financial analysis at the dawn of the Industrial Revolution. Businesses at that time, when they opened their doors, had to be sure they could last the day, and so they had to have cash to make change and sufficient liquidity to secure their other transactions. Basically, what was needed was sufficient cash to satisfy what economists like to call transaction demand and some security beyond this for purposes of what economics refer to as a precautionary demand for cash. So cash flow analysis is what was focused on at that time.

Businesses were simple; there was no complex manufacturing, where the determination of product costs and the requisite financial statements are very significant. Enterprises were predominantly simple, service-type businesses: trading and very rudimentary manufacturing, and such.

Then, in the early 1800s, what was then Britain (United Kingdom now) passed what were known as the Company Acts. The British Company Acts mandated the compilation of something pretty close to what we now know as the balance sheet, and that changed the focus from a cash flow analysis to a balance sheet analysis. This change was prompted by banks, which understood borrowing customer solvency in terms of a relationship between assets and liabilities; hence an emphasis upon the balance sheet.

Bankers are now far more intelligent and sophisticated in financial affairs, understanding that it is really income and basically cash flow that will repay their loans. But bankers at that time wanted to look at balance sheets. They believed that in the event of the insolvency of their borrowers, they could proceed against the physical assets of these borrowers and wished to know the book values of these assets, as well as the amount of claims standing in line with them for satisfaction. This knowledge required balance sheets prepared on the basis of historical costs. So income, while of some importance as a measure of business stability and success at the time, was of secondary consequence and was computed indirectly.

You would determine net income in those days according to what is now referred to as the net worth method. The net worth method of net income determination is basically as follows: you compute net worth at the beginning and at the end of the year ($\text{Assets} - \text{Liabilities} = \text{Net Worth}$), as found on the balance sheet, compare these two net worth figures, add back a capital consumption allowance (depreciation), and you have your net income for the year. Accordingly, net income was not computed directly at the time as is done today, but was ascertained as a derivative from the balance sheet. This was because, as noted, at the time net income was of secondary importance, and cash flow was of even less consequence.

As time went on and there were financial upheavals and monetary panics aplenty on both sides of the Atlantic, investors and bankers began to realize the limited nature of the net worth method, not only for an accurate determination of net income, but also as a gauge in determining expected business solvency. Change in the focus of financial analysis and the relative importance of the various financial statements and income determination methods was on its way. However, it is interesting to note how long it took before a fundamental alteration took hold in the emphasis placed upon the various types of financial analysis.

Most people do not recognize that it wasn't until the beginning of the

Depression Era, the early 1930s, when the New York Stock Exchange mandated basically what we call today the matching principle: the accounting matching of revenues and expenses, as undertaken in the typical income statement, that a separate form of income determination apart from the balance sheet grew to general use. And so it was not until the Depression Era that the income statement, the matching principle, and the separate determination of net income gained ascendancy as the predominant form of financial analysis. Further, we can see why this would be the case at that time. During the Great Depression income was so scarce and hard to come by that its separate determination was called for. In the early 1930s, interest rates were extremely low, in some cases negative. Banks closed their doors in record numbers, and the power of bankers to influence the course of events was on the decline. Income analysis became more and more important, and net income analysis and the income statement predominated as a form of financial analysis. This persisted until relatively recently.

In the 1970s, with great inflation, income computations according to the traditional methods, with the use of historical costs, became a bit silly and meaningless due to the misapplication of valuation with respect to the balance sheet. The significant level of inflation made these historical costs less meaningful, and what was found on the balance sheet (basically historical cost determined assets that represented unexpired costs) went into the income statement as these costs expired. In that these costs were no longer a reflection of current valuation in a highly inflationary era, the balance sheet (which was already in considerable disrepute) went into even further decline as an analytical tool, and an understanding developed that the income statement was not very meaningful, either, without some adjustments. Accordingly, price level adjustments that had been developed for some time resurfaced as a means of enhancing the analytical use of both the balance sheet and the income statement.

Basically, the conditions of the time led to an understanding that neither the income statement nor the balance sheet was of much analyti-

cal value in dealing with the prevalent business environment. Different product costing techniques, such as LIFO, FIFO, and average, led to very different accounting results. Similarly, different depreciation techniques – straight-line, double declining balance, etc. – led to very different income statement and balance sheet results. And while new financial analytical methods were called for, it was really old techniques that were found to deal with the requirements of the times.

Cash flow analysis became more and more in vogue because of its ability to deal with the economic exigencies of the time and its lessened degree (as compared to the balance sheet and the income statement) of being subject to accounting manipulation by the preparers of financial statements in order to portray the desired results. Today, cash flow analysis truly is by far the most important kind of financial analysis, and most finance professors now deal with their students in terms of free cash flow (cash flow from continuing operations less capital expenditures and dividends) in that it leads to an enhanced ability to effectively analyze the firm, regardless of the level of inflation or the accounting techniques that are used. That is, free cash flow provides a far better handle on the solvency and productive operations of a firm than the income statement or the balance sheet. This is especially true in difficult and volatile economic times.

With the return of the ascendancy of cash flow analysis after many centuries have also come many alternative ways of understanding cash flow. Free cash flow is just one of them; there are others. It has been an interesting metamorphosis through the years. We're back where we started at the dawn of the Industrial Revolution, with cash flow predominating as a financial analytical tool.

The high-profile bankruptcies of the 1990s and early 2000s have certainly helped bring about this change. Moreover, the financial bubble at that time, which in many ways reflects other such bubbles of other centuries, also reflects this – a need to get away from allowing businesses to tell us what they want to tell us and what they want us to believe they are worth. We have to look beyond some of the inherent

misstatements in the balance sheet and the income statement and the amenability of these forms of financial analysis to manipulation by some unscrupulous financial managers who sometimes find it desirable to tell lies to cover misdeeds or poor financial performance. It is important that financial analysts employ techniques that will effectively determine the value of businesses they are studying.

Mergers and Acquisitions

There were three merger waves (or major merger movements) in U.S. financial history. Interestingly, these three separate waves emphasized different forms of business combinations and financing methods, but similar causes for their cessation in terms of overriding events.

The first such wave was horizontal in character, used European capital (principally British), began in the last years of the 19th century, and was ended in 1914 by the onset of the hostilities of the First World War (then called the Great War). Unknown to many at the present time is that the mergers that were consummated during this time brought together many of the great industrial aggregations of today – IBM, General Motors, U.S. Steel, and others were each put together during that time. These mergers were largely created by buying out competitors: John D. Rockefeller, who had earlier put together Standard Oil, offered to either economically kill off his competitors or buy them out. Paradoxically, those who were forced to “invest with him” did very, very well.

The merger movement of the 1920s was quite different in all respects noted. This second merger wave was assisted by a philosophy of the time of buying stock that came back in the 1990s, the so-called “one bigger fool philosophy” of investing. It didn’t matter (as also occurred in the 1990s) how high a price you paid, as long as you bought a “growth company’s stock.”

The method of identifying a “growth company” or the valuation technique employed was not nearly so important as the field the company was in. In the 1920s the business area in vogue was technology connected to radio waves. While most stocks during that decade rose out of all proportion to value, radio was the “pet” technology of the time. If this sounds alarmingly similar to the stock market exuberance of the 1990s, it is common to almost all market bubbles. It almost didn’t matter in the 1920s and 1990s what you paid for a stock. As long as you bought a growth company’s stock, you would benefit, because regard-

less of what you paid, you'd find a bigger fool to sell it to, someone who would be willing down the road to pay a higher price. Obviously, that is foolish almost beyond comprehension. But this type of financial analysis (non-analysis would be more proper) is the norm during stock market bubbles.

Valuations get way out of line during such times, and this was surely the case in both the 1920s and the 1990s. The result was the same in both cases, as well: a market crash (in one case abrupt, in the other prolonged) and an end to the merger movement of the time. The merger wave of the 1920s was fueled by excessively rising stock prices. The nature of most of the mergers of the decade was vertical. The antitrust laws in place at the time could be used to successfully attack horizontal mergers. However, these laws and those who were charged with the duty to enforce them lacked either the power or the will to attack vertically-based mergers. Accordingly, companies began integrating from the raw material phase to the consumer phase, and those kinds of mergers were not as successfully attacked as horizontal mergers. As might be expected, the stock market crash of the late 1920s and the market and economic depression that followed in the 1930s brought an end to the second merger movement.

Investors were generally uninterested in stocks during the World War II years of the 1940s and the Korean War years of the early 1950s. However, by the end of the 1950s, equity buying came back a bit. By the early to mid-1960s equity prices retained and held the levels of market peaks of the late 1920s and different kinds of mergers started coming about. These forms of mergers have persisted in various ebbs and flows to the present time: conglomerate mergers. These forms of mergers are neither vertical nor horizontal, as was the case in the two earlier merger waves.

Conglomerate-type mergers, which are very difficult to attack with the traditional application of the antitrust laws, became the state-of-the-art merger form in the 1960s. Once again, rising stock prices and, at times, a detachment of share value and price provided a currency by

which such mergers could be accomplished. Earnings per share calculation (net income divided by shares outstanding) became a common form of financial analysis at the time, and, as long as an acquiring firm bought a company with a lower price/earnings ratio, they could be pretty well assured, simply on a mathematical basis, of increasing their earnings per share through the merger.

Interesting also is the frequent use of the security form favored at the time to accomplish many of the mergers of this era. Convertible securities came into common use and were most popularly employed in the most recent merger wave. Such securities, while not strictly common stocks, were convertible into common stocks, often with unique and arcane conversion privileges.

These securities fueled the third merger wave and were predominantly responsible for coining the title of the most recent merger movement as the “funny money merger movement.” This merger wave, with various fits and starts, continued through the 1990s, but was brought to a conclusion by the bear market that followed.

Accordingly, the three merger waves in U.S. financial history have some differences in merger forms (horizontal, vertical, and conglomerate) and financing methods, but also some commonalties in being fueled by irrational stock market exuberance and ending in cataclysmic events.

Dividends

Over the last 25 years of the 20th century, cash dividends declined as a percentage of earnings, but companies paying higher cash dividends have generally experienced higher returns during periods of market downturn. Dividends cushion the stock price fall and normally prop up share returns as long as the dividend can be sustained. However, there have been many cases of cuts in cash dividends. So the purchase of equity shares simply because of a current high dividend yield (dividends/stock price) cannot assure success. Accordingly, the ability of a company to maintain, or possibly increase, its cash dividend is an important aspect of share valuation for stocks with a high dividend yield. The best way to understand the ability of a company to continue paying its current dividend is by looking at the firm's cash flow, not necessarily the income statement or the balance sheet.

A common fallacy with respect to dividends paid in a company's stock (stock dividends or stock splits) is that investors get something of value as the result of the share distribution. Uninitiated investors normally like receiving such share distributions. They often feel a stock is cheaper if it's at 20 as opposed to 40. This is silly in that if a company has 200 shares outstanding at a price of \$20, it is quite the same thing as having 100 shares outstanding at a price of \$40. In both cases the total capitalization (shares outstanding multiplied by their market price) of the firm is \$4,000. All it has accomplished as the result of a two-for-one stock split or a 100 percent stock dividend is to double the number of shares outstanding with an almost certain halving of their market price. Stockholders have more pieces of paper as the result of a share distribution, but no increase in total value. So stock dividends and stock splits, when unaccompanied by increases in earnings or cash dividends, do not really mean a thing.

With electronic recording of share ownership, having more pieces of paper is not of great consequence. However, in terms of transaction costs, when investors seek to sell their shares, the cost of exiting their position will generally be greater if a larger number of shares are sold.

This is particularly the case for institutional investors such as mutual funds that pay their commissions on the basis of pennies per share. The greater the number of shares such investors sell, the more the trade will cost.

Also of consequence in this respect is the bid-ask spread, which is the difference between what an investor can sell his or her shares for at any particular time versus the price the investor must pay if the shares are bought at that precise time. (Bid-ask spreads are more commonly known as the price a dealer will pay for a security – the bid price – versus what the dealer will sell the security for – the ask price). Accordingly, other things being equal, in terms of the total cost of the bid-ask spread, the greater the number of shares involved in any particular transaction, the larger the cost to the investor. In essence, the bid-ask spread is also a form of transaction cost in addition to commissions and must be considered in determining the cost of entering and exiting a position in stock. If an investor has more shares as the result of a share distribution, his or her transaction costs will, other things being equal, be greater. In this sense, contrary to popular belief, share distributions provide negative value to investors.

International Finance

International finance is, of course, a vital aspect of the overall area of current finance. However, “international finance” is something of a misnomer in that it presumes that if there is an international side to finance, there must also be a domestic understanding of the field. In the modern era all finance is international, especially as the result of advances in communication technology.

In contemporary times money flows around the globe seeking its best levels, like water – in terms of risks, returns, and entry and exit mechanisms. The large securities firms and investors pass their portfolios around the globe seeking optimum commitments in terms of risks, returns, and entry and exit costs. (Portfolio diversification is also a consideration for such investors; however, the complexities of diversification are beyond the scope of this analysis.) Large securities firms and investors can trade on a 24-hour basis; they can trade at any time and place they wish. As a result, in the contemporary world all finance is international and has been so for some time. National boundaries no longer come into play with respect to large-scale investing, and since large investors move markets, all current finance may be said to be international.

This was surely not always the case in the past as financial transactions across international borders were often greatly hindered at one time as the result of national concerns with sovereignty and other similar issues. Relative exchange rates between currencies fluctuated greatly at one time, consequently drying up international trade because of the uncertainty as to the domestic value of international transactions that were to be settled in the future.

In the modern era these concerns have been alleviated as a result of the development of effective markets in international currencies that allow for transactions calling for the future delivery of any of the world's major currencies. For example, a wine merchant in New York who is required in one month to pay a fixed amount in Euros for the

purchase of French wine can, with U.S. dollars, buy Euros for one-month delivery, thereby fixing his commitment in dollars and eliminating the possibility of loss in dollars through the adverse movement during the month of the dollar versus the Euro. This has greatly enhanced international trade, with the consequent benefit to both sellers and buyers of international products and services and the countries involved.

Allan E. Young earned his PhD at Columbia University. He is a professor of finance, chairman of the Finance Department, and senior researcher at the Michael J. Falcone Center for Entrepreneurship at the School of Management of Syracuse University.

Dr. Young has authored or co-authored eight books and more than 80 articles and chapters in leading academic and professional publications and books, and he has given more than 130 lectures outside the university setting for business and professional groups on all of the world's continents. His current research interests include, among other areas, developmental finance, micro lending, valuation, privatization, emerging and developing financial markets, entrepreneurship, and other related topics. In addition to a number of for-profit and academic entities, he has recently consulted with the United Nations, the U.S. Agency for International Development, the Securities Industry Association, and the governments of a number of developing countries and those seeking to make the transition from a centrally planned to a market-based economy.

The above chapter represents a brief exploration into some of the significant current issues and concerns in finance. It should be noted that further and more detailed study of these concepts is necessary for a fuller understanding of them.