

PERSPECTIVES

The Economics of Short-Term Performance Obsession

Alfred Rappaport

A company's value depends on its long-term ability to generate cash to fund value-creating growth and pay dividends to its shareholders. Even so, investment managers commonly base their stock selections on short-term earnings and portfolio tracking error rather than discounted cash flow (DCF)—the standard for valuing financial assets in well-functioning capital markets. Financial analysts fixate on quarterly earnings at the expense of fundamental research. Corporate executives, in turn, point to the behavior of the investment community to rationalize their own obsession with earnings. "Short-termism" is the disease; earnings and tracking error are the carriers.

The gap between theory and practice prompts four basic questions:

- Why do investment managers focus on quarterly earnings?
- Can stock prices be allocatively efficient when short-term earnings and tracking error dominate investment decisions?
- Can investment managers earn excess returns if they buy and sell stocks they believe the market has mispriced on a DCF basis?
- Is corporate management's focus on short-term earnings self-serving or also in the best interests of its shareholders?

After addressing these questions, I present a three-pronged program—improving corporate performance reporting, incentives for corporate managers, and incentives for investment managers—for reducing short-term performance obsession.

The Focus on Quarterly Earnings

The fascination of investment managers with quarterly earnings is not terribly puzzling. In fact, it is perfectly rational in a market dominated by agents responsible for other people's money but also look-

ing out for their own interests. The problem is that earnings data are not well suited for use in valuation.

The Appeal of Earnings. Most investment professionals recognize that DCF analysis is the appropriate model for valuing financial assets, including equities. But they believe that estimating distant cash flows is too time-consuming, costly, and speculative to be useful. Because they have much less information about a company's operations and prospects than insiders do, they tend to attach substantial weight to reported short-term performance. Short-term performance is particularly significant for younger companies, where expectations about future growth are much more sensitive to current performance, than for companies with established operating histories.

CEOs and other senior corporate executives concerned with their reputations and the company's stock price also focus on reported short-term performance measures, particularly earnings. As a consequence, investment and corporate managers have a mutually reinforcing obsession with short-term performance, with earnings the most widely accepted metric.

Sizable stock price responses to earnings surprises suggest that short-term earnings, not long-term cash flow prospects, fuel price changes. But whether prices respond mechanically to earnings announcements, to new information about longer-term prospects conveyed by components of earnings, to both, or to neither is not clear.¹ What is clear is that portfolio managers who are able to accurately and consistently forecast year-ahead earnings can earn extraordinary returns (see Hagin 2004).

It is easy for investors who observe sizable price responses to earnings surprises to conclude that using "irrational" earnings analysis is better than using the "rational" DCF model, which they view as theoretically valid but practically disconnected from expected returns. When the risk in going against the market's apparent pricing model is greater than the reward, it is best to join the market. The cumulative effect of such thinking becomes a self-fulfilling prophecy.

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The final factor that appears to favor short-term earnings over long-term cash flows is the relatively short holding period for stocks. The average holding period until the mid-1960s was about seven years. Today, the average holding period in professionally managed funds is less than a year and annual portfolio turnover is greater than 100 percent.² The shorter the holding period, the more the beliefs of others rather than long-term fundamentals become central to investment decisions. High turnover thus sets the stage for short-term earnings-based decision making or momentum-motivated trading, which is not at all concerned with earnings. Welcome to Keynes' beauty contest.³

Short-horizon investors expect to derive substantially all of their proceeds from selling shares at the end of their investment horizons and obtain very little from cash dividends. With dividend yields recently averaging about 2 percent, and assuming a one-year horizon, about 98 percent of total cash proceeds can be expected to come from selling shares. Without a dividend or cash flow anchor, short-horizon investors focus on forming an expectation about the end-of-horizon selling price. This expectation depends, however, on the impossible task of assessing the expectations of countless other investors with varying investment horizons and then finding the price by backward induction. Faced with this hopeless task and under pressure to show acceptable short-term performance, investment managers turn to short-term metrics, particularly earnings, to project end-of-horizon prices.⁴

The Limitations of Earnings. The accountant's bottom line approximates neither a company's value nor its change in value over the reporting period. And it was never intended to. Valuation is the investor's job, not the purpose of financial reporting.⁵ Earnings are relevant to valuation to the extent that they help investors and analysts estimate the magnitude, timing, and uncertainty of future cash flows. But two factors severely limit the usefulness of earnings for forecasting cash flows.

First, companies manage earnings because they have considerable latitude in estimating the amount and timing of accruals, such as for restructuring, employee pension costs, stock option grants, and sometimes even revenue. Second, and more significantly, accruals deal with only a small fraction of the cash flows investors need to value stocks. This critical but generally ignored limitation calls for a brief explanation.

Earnings are an amalgam of facts (realized cash flows) and assumptions about future out-

comes (accruals). The cash flow portion of earnings consists of the cash a company receives for current-period sales minus the cash it disburses to suppliers and employees for products and services used during the period. Revenue and expense accruals (excluding arbitrary depreciation and amortization charges) reflect the company's estimates of subsequent-period cash receipts and payments, respectively, that will arise from the most recent period's sales and purchase transactions. Contracts between the company and its customers (receivables, unrealized gains or losses on long-term sales contracts, product warranties), employees (defined-benefit pension plans and other postretirement benefits, stock options), suppliers (payables), and government (taxes, environmental obligations) determine the amounts that companies record.

The crucial point is that accruals encompass only *existing*, incomplete contracts whereas the overwhelming majority of a company's value derives from cash flows attributable to *future* sales and purchase contracts. The estimated present value of existing contracts typically accounts for less than 5 percent of a company's share price, and astute analysts view that amount (given company managers' considerable latitude in establishing accrual amounts) with understandable caution.⁶

Not only do revenue and expense accruals convey information about a relatively small fraction of a company's cash flow value, the earnings figure—which combines realized cash flows and uncertain accruals—masks even this limited information. For example, a positive earnings surprise does not necessarily signal an increase in value. Companies can boost their earnings without creating value through accounting shenanigans and through value-destroying underinvestment, which investors cannot easily detect. Additionally, shareholder value increases only if a company earns a rate of return on its new investments that is greater than its cost of capital. Earnings, however, can increase not only when a company is investing at a rate above its cost of capital but also when it is investing at a rate below its cost of capital.

To find the preponderance of a company's value, analysts must go beyond financial statements. To evaluate the sustainability and potential growth of sales and cash flow, they must weigh such factors as industry growth potential, the company's competitive position, the likely behavior of competitors, technological change, and quality of management.

Stock Prices and Efficiency

Theorists define three types of market efficiency—informational efficiency (prices fully reflect all relevant information and there are no free lunches), fundamental efficiency (prices correctly reflect “fundamental value”—that is, the discounted sum of expected future cash flows), and the basic function of the capital markets—allocative efficiency (market prices allocate scarce resources to businesses with the most promising prospects). The biggest roadblock to attaining allocative efficiency is the persistent use of non-DCF models for stock analysis.

Informational, Fundamental, and Allocative Efficiency. Behavioral economists distinguish between informational efficiency and fundamental efficiency (see Shleifer and Vishny 1997; Shleifer 2000; Barberis and Thaler 2003). In an informationally efficient, or no-free-lunch, market, stock prices fully reflect all relevant information, thus preventing investors from earning excess returns by using available information. As evidence of informational efficiency, researchers point to the notable scarcity of investment strategies or professional money managers that outperform the market over long time periods.

So, how can the enormous amounts spent on investment research be reconciled with an informationally efficient market?⁷ Grossman and Stiglitz (1980) argued that prices cannot perfectly reflect available information. Because research is costly, investors who expend resources to obtain information expect to receive compensation in the form of excess returns. This logic holds in a world of economically rational individuals who invest their own funds—a world of principals without agents. In the existing agent-dominated market, however, it is perfectly rational for active fund managers to incur costs, even when they face long odds of achieving excess returns, as long as fund shareholders, not managers, bear the costs. The result is what I call “subsidized informational efficiency,” and it sets on its head the conventional wisdom that informational efficiency depends on market participants disbelieving it. Paradoxically, active investment managers contribute to informational efficiency, not by maximizing long-term returns, but by closely tracking their benchmarks and thereby constraining their ability to outperform the benchmarks.

Stock prices reflect information *relevant to the models investors use*. Investment managers have little incentive to pursue private information that contributes to more allocatively efficient prices unless such information is also relevant to their decision models. In other words, active managers can pro-

duce an informationally efficient market without necessarily making it highly allocatively efficient.

How does fundamental efficiency differ from informational efficiency? In an informationally efficient market, there are no free lunches; in a fundamentally efficient market, “prices are right.” Fundamental efficiency is not an empirically refutable hypothesis because in a sea of uncertainty and heterogeneous beliefs, the right price is indeterminate.

Not only is the right price for a stock unknowable today, but we cannot determine it at a later date because future prices will not be based on today’s information but on revised information. When market observers contend that stocks were mispriced in the past, they typically exhibit hindsight bias by relying on information that only became available subsequent to the alleged mispricing. The countless event studies conducted since the late 1960s address the informational efficiency of stock price *changes* rather than the fundamental efficiency of stock price *levels*. This is no surprise because tests of fundamental efficiency necessarily presuppose the implausible—knowledge of the right price.

The most basic function of capital markets is to allocate scarce resources to enterprises with the most promising long-term prospects. Perfect resource allocation—like its equivalent, fundamental efficiency—assumes flawless foresight in pricing stocks. Allocative efficiency, or how well market prices allocate resources, depends on the skills of informed buyers and sellers with competing estimates of DCF values.

The always uncertain future affords the most prescient investors opportunities to earn excess returns by betting against current market prices. Their competitive advantage lies in their superior ability to correctly anticipate the longer-term valuation implications of currently available information before others do. In other words, the market provides no free lunch, but it does provide occasional early bird specials for the most skillful investors.

This *nearly* informationally efficient market dominated by investors who use sound valuation models will be difficult to attain in an environment largely populated by agents with imperfectly aligned incentives. This problem becomes evident by examining the pervasive use of non-DCF models.

Non-DCF Models. The quarterly performance of fund managers is typically evaluated relative to a benchmark, such as the S&P 500 Index, as well as relative to peers. Understandably, managers focus on short-term relative performance and are hypersensitive to tracking error. Thus, funds tend

to be managed by “closet indexers” who prefer the safety of performing acceptably close to the index to the more personally risky strategy of trying to maximize long-run returns. These managers argue that failure to achieve acceptable benchmark performance in the short run could lead to large fund withdrawals and their possible dismissal.

Some investment managers select stocks based on near-term investor sentiment and/or play the earnings-expectations game—both non-DCF approaches that limit alpha prospects when everyone is fishing in the same pond.

In the search for mispriced stocks, investment managers use fundamental analysis, which allegedly takes a long-term view of the company’s prospects. Because forecasting cash flows is considered speculative and costly, however, much of what is known today as fundamental analysis entails the use of shortcut metrics—price/earnings, price/sales, and price/book multiples—that sidestep direct forecasts.

Analysts typically use the metrics comparatively. They attempt to identify investment opportunities by comparing, for example, P/E multiples of companies within the same industry and taking into account differences that warrant higher or lower multiples.⁸ Such relative valuation exercises make no effort to independently estimate the absolute value of stocks and thereby *make no direct contribution to allocatively efficient prices*.

Technical analysis makes no pretense of being concerned with company fundamentals or prospective cash flows. It involves studying patterns of stock price movements and volume in search of profitable buy and sell signals.

Index funds make no independent contribution to allocatively efficient prices because indexing requires no valuation. Equity index funds now represent about 15 percent of all equity fund assets in the mutual fund industry.

Restrictions on short selling are a barrier to allocatively efficient prices because they limit the ability of pessimistic would-be short sellers to reflect their opinions in prices. The restrictions affect allocative efficiency only, however, if the would-be short sellers use DCF analysis.

Finally, some investors do not base their decisions on expected returns at all. In the words of Fama and French (2004), they treat equity investments as “consumption goods.” Examples include socially responsible funds, employees who hold large undiversified positions in their employer’s stock to demonstrate loyalty, and investors who enjoy holding growth stocks and dislike distressed (value) stocks.

The pervasive use of non-DCF investment models makes it difficult to conclude that prices are allocatively efficient. Nevertheless, we would not be prudent to entirely dismiss the possibility that the *aggregation* of many investors with diverse decision rules and information sets can somehow discover allocatively efficient prices in an Adam Smith invisible-hand fashion.⁹

The Possibility of Excess Returns

Given the lack of use of DCF valuation by market participants, can investment managers earn excess returns by buying and selling stocks they believe, based on DCF analysis, the market has mispriced? The efficient market literature assumes that when stock prices diverge from informed estimates of DCF values, arbitrageurs buy or sell to bring prices back into line. Recently, behavioral economists have argued, however, that arbitrage is risky and costly, which severely limits the opportunity of arbitrage to exploit mispricings (see, e.g., Barberis and Thaler). Not surprisingly, professional arbitrage—such as that conducted by hedge funds—is concentrated in the bond and foreign exchange markets, where investors can estimate value with far greater confidence than in the stock market.

If arbitrage is not feasible, then investors seeking to exploit mispricings must trade on their ability to translate available information into better estimates of value than the current stock price. This process is, of course, also risky and costly.

If short-term earnings information dominates stock price changes, why should long-term investors base their decisions on a company’s cash flow prospects? The simple answer is that stock prices ultimately depend on a company’s ability to generate cash flow.

Two basic factors shape the returns from a stock you believe to be mispriced on a DCF basis. First, the greater the estimated mispricing relative to the current stock price, the greater the potential return. (Of course, a stock may turn out to be mispriced but not by as much as you believe.) The second factor is the time it takes the stock price to converge toward what you believe to be the right price. The shorter the time, the greater the return. The longer it takes, the lower the return.¹⁰

For the price to move toward your target price, other investors must come to agree with your assessment of the company’s prospects or the prospects must become obvious from the information investors tap to make their trading decisions. For example, if you conclude through a DCF analysis that a stock is undervalued, you must, in an earnings-driven market, rely on future reported earnings to

correct the mispricing. As long as short-term earnings analysis and noise dominate price changes, prices may not converge quickly toward your target estimate of value. As Keynes cautioned more than 75 years ago, markets can remain irrational longer than you can remain solvent. Finally, unanticipated information may produce favorable price changes in the stock, but investors using DCF analysis face the risk, as do arbitrageurs, that new, unanticipated information will trigger unfavorable price changes.

In this environment, only individuals with brains, resources, a long investment horizon, and no agency conflicts are promising candidates for exploiting mispricings. If their chances of success are to improve, the market's fascination with the short-term and its obsession with earnings will have to change.

Short-Term Focus and the Shareholder

Is corporate managers' focus on short-term earnings entirely self-serving, or is it also in the best interests of shareholders? Corporate executives point to the behavior of market participants to justify their short-term focus and their belief that investing for the long term is not rewarded by higher stock prices.¹¹ This bias is reinforced by incentive compensation plans that reward short-term financial performance. Even equity incentives, such as stock options and restricted stock, do not alter the short-term orientation of executives if they believe that near-term performance is the primary influence on stock prices. To the contrary, incentives for options-laden executives to misrepresent publicly reported financial information increased during the 1990s.

Compelling evidence indicates that managers are obsessed with earnings. A recent survey of 400 financial executives shows that the vast majority view earnings as the most important performance measure they report to outsiders (Graham, Harvey, and Rajgopal 2004). The two key earnings benchmarks are quarterly earnings for the same quarter last year and the analyst consensus estimate for the current quarter. Executives believe that meeting earnings expectations helps maintain or increase the stock price, provides assurance to customers and suppliers, and boosts the reputation of the management team. Failure to meet earnings targets is seen as a sign of managerial weakness and, if repeated, can lead to a career-threatening dismissal.¹²

The obsession of corporate managers with short-term earnings is understandable; the question is whether this focus contributes to or compromises shareholder value in a market where stock prices respond to earnings information.¹³

The idea that management's primary responsibility is to maximize long-term shareholder value is widely accepted in principle but imperfectly implemented in practice. Maximizing long-term value means that management's primary commitment is to *continuing shareholders* rather than to day traders, momentum investors, and other short-term-oriented market players. To maximize value to continuing shareholders, managers must develop and effectively execute strategies that maximize the company's long-term cash flow potential.

Managing for short-term earnings compromises shareholder value in two ways. First, companies delay or forgo value-creating investments to meet consensus earnings expectations. Although such actions improve the current period's reported earnings, they reduce the company's earnings potential and value. Graham et al. reported a startling 80 percent of survey respondents would decrease discretionary spending on research and development, advertising, maintenance, and hiring to meet earnings benchmarks and more than half would delay a new project even if it entailed giving up value. As Graham et al. aptly observed, "Getting managers to admit such value-decreasing actions in a survey perhaps suggests that our evidence represents only the lower bound of such behavior" (p. 16). The willingness of executives to forgo or delay value-creating activities to meet quarterly earnings targets is evidence of the importance they attach to meeting expectations.

Second, a focus on short-term earnings compromises shareholder value because managers exploit the discretion allowed by the accounting rules in the calculation of earnings by pushing revenues into the current period and deferring expenses to future periods. Borrowing from the future to satisfy today's earnings expectations inevitably catches up with the borrowing company, and it eventually can no longer meet market expectations. When a company can no longer deliver on expectations, the market hammers the stock price. Jensen (2004) noted the hundreds of billions of dollars of market value eroded by overvalued equity. He cited WorldCom, Enron Corporation, Nortel Networks, and eToys as companies that pushed earnings management beyond acceptable limits to meet expectations and ended up destroying part or all of their value.

Maximizing long-term cash flows rather than managing for short-term earnings, even in an earnings-dominated market, is the most effective means of creating value for continuing shareholders. The governing objective of managing in the interests of continuing shareholders justifies this conclusion. And the conclusion holds even for companies that engage in significant transactions in their own stock.

Companies ordinarily create a large part of their value from operations. But they also issue new shares and repurchase outstanding shares. These financial transactions can create or destroy significant shareholder value. Indeed, a possible argument in favor of managing for short-term earnings is that an earnings-addicted market will price new shares favorably, which benefits continuing shareholders because shares are sold to incoming shareholders at a higher price. This argument has three flaws.

First, reporting rosy earnings, whether accomplished by operating decisions that compromise value or accounting gimmicks, will sooner or later catch up with the company, at which point, the value of continuing shareholders' shares will fall significantly. Second, when an acquiring company offers shares to the selling company's shareholders, the attractiveness of the offer is not evaluated by short-term earnings results but by comparing the expected value of the selling shareholders' interest in the combined enterprise with the current share price. Third, if a company needs to raise funds but its managers believe its shares are undervalued, the company still usually has alternatives to equity financing, such as debt financing or limiting dividend payouts.

Not only is earnings management of questionable value in the issuance of new shares, it can destroy significant value when companies use it as the criterion for share buybacks. A company should repurchase shares only when its stock is trading below management's best estimate of value and when no better investment opportunities are available. Companies that follow this guideline serve the interests of continuing shareholders, who, if management's assessment that shares are undervalued is correct, gain at the expense of shareholders who voluntarily tender their shares.

Spurred by the belief that investors mechanically apply a multiple to current earnings to establish value and the fact that management compensation is partially tied to earnings performance, some companies repurchase shares even when they believe shares are fairly valued or overvalued. When an immediate boost to EPS rather than value creation dictates share buyback decisions, wealth is transferred from continuing shareholders to exiting shareholders. Especially widespread are buyback programs that offset the EPS dilution from employee stock option programs. In these cases, the exercise of options by employees rather than valuation dictates the number of shares and the prices at which they are repurchased.

Attacking Short-Term Performance Obsession

To reduce short-term performance obsession and improve allocative efficiency, I propose a three-pronged attack—on corporate performance reporting, on incentives for corporate managers, and on incentives for investment managers.

Corporate Performance Reporting. Relevant, transparent, and timely information is vital to the allocative efficiency of markets. In the present unforgiving climate for accounting shenanigans, companies have an unprecedented opportunity to meaningfully improve the form and content of their financial statements. Thus, not only will improved disclosure be an antidote to earnings obsession, but it will also be an act of enlightened corporate self-interest that can reduce investor uncertainty, decrease the company's cost of capital, and restore confidence in corporate reporting.

An ideal "Corporate Performance Statement" is shown in **Exhibit 1**. It would do the following:¹⁴

- separate cash flows and accruals,
- classify accruals by levels of uncertainty,
- provide a range and the most likely estimate for each accrual,
- exclude arbitrary, value-irrelevant accruals, and
- detail assumptions and risks for each line item.

Separating realized cash flows from forward-looking accruals provides a historical baseline for estimating a company's future cash flow prospects and enables analysts to evaluate the reasonableness of accrual estimates. Although accruals ordinarily account for only about 5 percent of a company's share price, separating cash flows and accruals provides investors a platform for assessing the remaining portion of the price. Transparent accruals also discourage companies from producing unrealistic estimates or engaging in outright fraud. Most importantly, separating cash flows and accruals helps restore confidence in the integrity of corporate reporting.

The Corporate Performance Statement calculates free cash flow as revenue minus operating expenses (with the noted exclusion of noncash charges) minus all investments, including working capital changes. Investments are those that appear on the balance sheet, such as production facilities, equipment, real estate, patents, and trademarks, as well as expenditures companies ordinarily expense for such activities as R&D, software development, and branding. Whether a company records an expenditure as an operating expense or a capitalized asset does not affect free cash flow because it is subtracted in either case.

Exhibit 1. The Corporate Performance Statement			
Revenue	\$		
(minus) Operating expenses: ^a			
Production			
Selling and marketing			
Administrative			
Current taxes			
= "Cash" operating profit after taxes			
(plus or minus) Change in working capital			
= Cash flow from operations			
(minus) Investments:			
Capital expenditures (minus proceeds from asset sales)			
Research and development			
Other intangible investments	—		
= Free cash flow (for debtholders and shareholders)	\$ <u> </u>		
	Most Likely	Optimistic	Pessimistic
Medium-uncertainty accruals			
Uncollectible receivables	\$	\$	\$
Warranty obligations			
Restructuring charges			
Deferred income taxes			
Unrealized gains on long-term contracts			
High-uncertainty accruals			
Defined-benefit pensions			
Employee stock options			
Management Discussion and Analysis			
^a Excludes noncash charges, such as depreciation, amortization, deferred taxes, and asset and liability revaluations.			

The Statement focuses on a company's operations. It is designed to replace the traditional income statement, but it cannot entirely replace the traditional cash flow statement because it excludes cash flows from financing activities—new issues of stocks, stock buybacks, new borrowing, repayment of previous borrowing, and interest payments. A new cash flow statement can begin with the "free cash flow" line of the Corporate Performance Statement and add and subtract the various financing activities to calculate the increase or decrease in cash.

The Corporate Performance Statement separates accruals into three increasing levels of uncertainty—low, medium, and high. Low-uncertainty, or "check is in the mail," accruals included in revenue and operating expenses are relatively low risk because a company normally expects to convert the corresponding receivables and payables into cash over the next accounting period. Medium- and high-uncertainty accruals

have longer cash-conversion cycles and wider ranges of plausible outcomes.

Companies typically develop estimates for medium-uncertainty accruals, such as allowances for uncollectible receivables and warranty obligations, from historical experience and modify the assumptions for changes in current conditions. For example, restructuring charges reflect estimates of future-period outlays for such things as severance pay, canceled leases, and litigation. Deferred-tax accruals result from temporary timing differences between pretax book income and taxable income for items such as depreciation expense. Estimated unrealized gains or losses from incomplete long-term construction, energy, and R&D contracts usually depend on assumptions about future prices, costs, and a host of other factors.

The cost of defined-benefit pension and employee stock-option plans are examples of high-uncertainty accruals. Pension expense, for example,

should reflect the change in the present value of the company's obligations minus the change in the present value of expected returns on pension fund assets. The calculation requires a panoply of assumptions, including projected employee turnover, future pay increases, estimated retirement dates, future market discount rates, and expected return on plan assets.

The traditional income statement, with its single-point accrual estimates, ignores the wide variability of possible outcomes—particularly for medium- and high-uncertainty accruals. The Corporate Performance Statement complements the most-likely figure for each accrual with optimistic and pessimistic estimates. These estimates, coupled with management's disclosure of the associated probabilities for each, help investors form their own expectations.

Value-irrelevant charges are not included on the Corporate Performance Statement. Low-, medium-, and high-uncertainty expense accruals are included as estimates of future cash flows a company needs to satisfy commitments to customers, employees, and suppliers arising from earlier arm's-length market transactions. In sharp contrast, companies record depreciation and amortization charges *after* the outlay of cash for investments. Faced with the unknowable magnitude and timing of future cash flows that capitalized assets will generate, accountants use arbitrary depreciation methods to assign expenses over their expected useful lives. This is clearly a case of accounting ritual trumping relevance. Therefore, depreciation and amortization are not included.

Nonrecurring gains and losses, charges from discontinued operations, and the effect of accounting changes that are disclosed in a "management discussion and analysis" section are excluded from the Corporate Performance Statement because they offer no meaningful help in forecasting the sustainability and growth potential of a company's cash flows.

The Statement presents no bottom line because no single number can reasonably encapsulate a company's performance. The traditional earnings bottom line misleadingly suggests that aggregating amounts based on past transactions and on uncertain assumptions about future transactions somehow yields an economically meaningful number, but the aggregate is not meaningful.

Finally, the Corporate Performance Statement includes a "management discussion and analysis" section in which management should present the critical assumptions supporting each accrual esti-

mate, the company's business model, and key financial and nonfinancial performance indicators that drive the company's value, such as customer-retention rates, time to market for new products, and quality improvements.

Will the Corporate Performance Statement prove too costly to produce? If the information is not already available for internal purposes, shareholders should be concerned about senior managers' grasp of the business and the board's exercise of its oversight responsibility. Board members, particularly members of the audit and compensation committees, should know, at a minimum, how much of the company's reported performance comes from realized cash flows and how much from accrual estimates and the risk that the most-likely revenue and expense accruals will prove to be materially misstated.

Incentives for Corporate Executives. Many commentators point to the deliberately deceptive accounting practices of Enron, WorldCom, Adelphia Communications, and other recent business failures and contend that the underlying cause is management's infatuation with shareholder value. This claim fails to capture the essence of the shareholder-value approach. The actions taken by these companies added no value; they were dishonest attempts to create the appearance that value was added. Shareholder value did not fail management; management failed shareholder value.

Most CEOs champion the goal of maximizing shareholder value but without embracing the essential determinant of value—risk-adjusted, long-term cash flows.¹⁵ Instead, they are obsessed with Wall Street's earnings-expectations machine and short-term share price. Sacrificing the company's long-term prospects to meet quarterly earnings expectations in an attempt to temporarily boost the stock price represents the antithesis of sound shareholder-value management. A driving force for such behavior can usually be traced to executive compensation schemes.

In the early 1990s, as corporate boards endorsed shareholder value, they became convinced that the surest way to align the interests of managers and shareholders was to make stock options a large component of executive compensation. By the end of the decade, stock options accounted for more than half of total CEO compensation in the largest U.S. companies. Options and stock grants also constituted almost half the remuneration of directors. But short-term thinking and earnings obsession did not decrease; they increased.

To discover what went wrong, you have only to examine the principal features of the standard option plan: The exercise price equals market price at date of grant and stays fixed over the entire 10-year term, and the typical vesting period is 3 or 4 years. Four factors limit the ability of such standard options to promote long-term value-maximizing behavior by corporate executives:¹⁶

- Performance targets are too low.
- Holding periods are too short.
- Underwater options (whose exercise price exceeds the current share price) undermine motivation and retention.
- Options can induce too little or too much risk taking.

CEOs widely declare their overriding commitment to achieving superior returns for shareholders. Standard stock options, however, reward performance well below superior-return levels. In a rising market, options can reward even mediocre performance because executives profit from *any* increase in share price—even one substantially below competitors or the broad market. The standard option is structured as if the opportunity cost of equity were zero. Because rising markets are fueled not only by corporate performance but also by factors beyond management control, such as changing interest rates, some executives enjoy huge windfalls simply by being in the right place at the right time. No board of directors should approve an incentive plan that provides significant option gains for a level of performance that could become grounds for dismissing the CEO. Nor should institutional investors who are judged by the alphas they deliver for fund owners remain passive as corporate boards reward executives who not only fail to produce positive “corporate alphas” but achieve returns well below their peers (i.e., negative alphas).

Relatively short vesting periods coupled with the belief that earnings fuel stock prices encourage executives to manage earnings, exercise their options early, and cash out shares opportunistically. These actions significantly diminish the long-term incentives that options and stock holdings are intended to provide. The practice of accelerating vesting for CEOs upon retirement adds yet another incentive to short-termism.

The standard stock option loses its power to motivate and retain executives when options are hopelessly underwater, and options fall underwater more frequently than is commonly believed. Hall (2003) reported that about one-third of all options held by U.S. executives in publicly traded companies were underwater in 1999 at the height of the 1990s bull market. Board responses, such as increas-

ing cash compensation, granting restricted stock, offering more options, or lowering the exercise prices of existing options, are shareholder-unfriendly tactics that rewrite the rules in midstream. They undermine the option incentive by turning it into a heads-I-win, tails-I-win arrangement.

Without equity-based incentives, executives tend to be excessively risk averse in order to avoid failure and dismissal. The standard option, however, does not necessarily induce greater risk taking. On the one hand, to preserve unrealized option gains, executives may bypass positive but risky value-creating investments. On the other hand, when their options are hopelessly underwater, executives with little to lose may pursue overly risky investments in a desperate attempt to resuscitate the stock price and the value of their options.

Companies can go a long way toward overcoming the shortcomings of standard options by implementing a *discounted indexed-options* plan with extended time horizons. In the best plan, indexed options have an exercise price tied to an index of the company’s competitors. Indexing to a broad market index, such as the S&P 500, is not recommended because, although broad market indexes are easily tracked, they do not reflect the particular factors that affect the company’s industry and, consequently, are not appropriate benchmarks for measuring and rewarding management performance. In the discussion to follow, indexed-options plans are based on a peer-group index or, for companies, particularly diversified companies, for which suitable competitors cannot be identified, a *discounted equity-risk options* plan is appropriate.

Indexed options do not reward underperforming executives simply because the market is rising. They are worth exercising only if the company’s shares outperform the index. Nor do they penalize superior performers because the market is steady or declining. If the index declines, then so does the exercise price, which keeps executives motivated even in a sustained bear market.¹⁷ Indexed options reward superior performers in all markets. They overcome two of the criticisms directed at standard options—performance targets are too low, and underwater options driven by a declining market undermine executive motivation and retention.

Companies can address the other two criticisms of standard options—holding periods are too short, and the options induce too little or too much risk taking—by extending vesting periods and requiring executives to hold meaningful equity stakes they obtain through option exercise or purchase of shares. Boards can also limit the sale of stock by CEOs over a two-year or three-year period after retirement to ensure a long-term focus.

Despite the plan's advantages, only Level 3 Communications, a telecommunications company, has adopted an indexed-options plan. Indexed options have been rejected because their cost must be expensed whereas the cost of standard options need only be disclosed in a footnote. This attitude underscores the rampant obsession with earnings. Stock options do not become more or less costly depending on whether the disclosure is made in a company's income statement or in its footnotes. Still, the requirement to expense indexed options has discouraged companies from adopting such plans. The expected Financial Accounting Standards Board requirement that companies expense standard options levels the playing field and perhaps will end situations where earnings consequences, rather than economic substance, dictate the choice of executive compensation plans.

CEOs understandably also shun indexed options because of their more demanding performance standard. To compensate executives for bearing greater risk, boards must offer more options so that high-performing CEOs will do better with indexed options than they would have with standard options.¹⁸

One response to the underwater option problem is that executives who underperform do not deserve incentive compensation. However, a management team without continuing incentives to create value is not in the best interests of shareholders.

When indexed options are used, more than 50 percent will underperform and fall underwater. The reason is that median stock price returns are less than average stock price returns because a relatively few stocks with extraordinarily high returns inflate the average. One way to resolve this dilemma is to use *discounted* indexed options, which lower the exercise price and allow executives to profit at a performance level modestly below the index.¹⁹ Suppose, for example, the index rises 10 percent, from 100 to 110, during the year. A 1 percent discount would reduce the year-end index from 110 to 108.9. The exercise price would, therefore, rise by only 8.9 percent instead of 10 percent. Discounted index options make gains accessible to more executives, motivate the best-performing executives to remain with the company, and encourage subpar performers to leave.

For companies unable to develop a peer index, discounted equity-risk options (DEROs) are suitable.²⁰ DEROs call for a significantly higher level of threshold performance than standard fixed-price options. But unlike indexed options, DEROs do not require the construction of an index. Specifically, the exercise price rises by the yield to maturity on the 10-year U.S. Treasury note plus a fraction of the expected equity risk premium minus dividends

paid to holders of the underlying shares. Suppose a company's shares are trading at \$100 at grant date, the yield on the most recently issued 10-year Treasury note is 4 percent, the equity risk premium is estimated at 2 percent, and the company must earn 50 percent of the premium before the options become profitable. The exercise price rises by 5 percent over the next year to \$105.00 before consideration of dividends. If dividends paid during the year totaled \$1.50 per share, the year-ahead exercise price would be \$103.50.

Treasury notes and the equity risk premium are used because the Treasury notes provide a nominal return (consisting of a real return, a return for expected inflation, and an inflation risk premium) and equity investors expect an extra return, the equity premium above the Treasury yield, as compensation for assuming the greater risk of equity investing. Arnott and Bernstein (2002) estimated the forward-looking equity premium to be close to zero, whereas Siegel (2002) estimated a future equity premium in the 2–3 percent range, which is in line with most other recent forecasts.

Choosing an equity-premium rate for a DERO plan becomes a much less daunting task when corporate directors recognize that nobody can reliably predict future return spreads between stocks and Treasury notes, that "expert" forecasts tend to cluster in a relatively narrow range, and that longer vesting periods for options and holding periods for company shares mitigate forecast risk because noise decreases with time. But any forecast "error" pales in comparison with the failure of standard options to incorporate *any* shareholder opportunity cost, not even the risk-free rate.²¹

Equity investors expect a minimum return consisting of the risk-free rate plus the equity risk premium. Following this line of reasoning, the exercise price of options should rise at a rate no less than the rate of this cost of equity. But this threshold level of performance may cause many executives to hold underwater options. Properly designed incentives will consider this delicate trade-off between setting performance at levels that compensate shareholders for taking on equity risk and the need to keep executives motivated. That is the purpose of the discounted equity-risk component of DEROs. If the board decides that only a fraction of the estimated equity risk premium will be incorporated into the exercise price growth rate, it is betting that the value added by management will more than offset the costlier options granted.

Finally, dividends should be deducted from the exercise price to remove the incentive for companies to hold back distributions to shareholders when no value-creating investment opportunities exist.

Incentives for Investment Managers. Even if improved disclosure along the lines of the Corporate Performance Report becomes accepted practice, earnings obsession will persist as long as investment managers have inadequate incentives to shift their analytical orientation toward valuing a company's long-term prospects. For this shift to occur, investment managers will need to be convinced, of course, that it will improve their performance and compensation.

Investment managers must overcome two fears before accepting the possibility that DCF analysis can boost their performance. The first is that others in the investment community will not follow and short-term earnings will continue to significantly influence stock prices. The second is the ever-present concern that forecasting highly uncertain cash flows is simply impractical.

As for the first concern, even if short-term earnings continue to influence stock price changes, the ability to make superior judgments about a company's future prospects is the key to successful long-term investing. In an earnings-dominated market, it simply takes time for the "earnings evidence" to materialize and be reflected in stock prices. The longer it takes, the more difficult it is for investors to earn excess returns. If investors do shift focus from short-term earnings to long-term cash flows, an investor's ability to achieve excess returns will depend on the investor's ability to interpret the valuation implications of information better than other market participants. Whether other investors shift their focus to long-term cash flows or not, active management is not for the fainthearted, and the key to success—making superior judgments about the future performance of companies—is the same.

The second concern—the reluctance to forecast cash flows—is easily dispelled. An analyst can, in fact, use the DCF model without assuming the burden of making independent cash flow forecasts. Think about it this way: It is difficult for any individual to forecast an uncertain future better than the collective wisdom of the market can. So, instead of forecasting cash flows, begin with the current price and determine the expectations for a company's future cash flows that justify the price.²² Estimating price-implied cash flow expectations is critical because only investors who correctly anticipate changes in a company's prospects that are not already reflected in the current price can hope to earn excess returns. But although this "expectations investing" approach blunts a major objection to DCF valuation, it also is no easy ticket to generating alphas.

In the absence of significant changes in performance evaluation and compensation arrangements,

investment managers are likely to cling to short-term accounting metrics, high turnover, and benchmark tracking. Because net inflows are positively correlated with a fund's recent performance, asset-based fees encourage managers to focus on short-term returns that increase the assets they manage.

Critics frequently recommend reducing the management fee and including a meaningful performance incentive in the compensation mix as a way to better align fund manager and shareholder interests. But if the management fee covers only the cost of servicing the account, a manager may focus disproportionately on the performance fee and take on unacceptable risk. Simply changing the mix of management and performance fees, therefore, will not take care of the major agency costs of delegated investment. More fundamental changes are needed in the structure of funds, design of performance fees, and choice of benchmarks for performance measurement.

Stein (2004) reported that open-end funds, which enable investors to liquidate shares at net asset value, account for 96 percent of total mutual fund assets and 93 percent of all funds. The open-end structure exposes even managers with outstanding track records to large withdrawals if they perform poorly in the short run or if equity prices experience a sustained downturn.²³ This risk discourages managers from making trades that are potentially attractive only in the long run. At first glance, then, open-end funds appear to be a losing proposition for managers. Managers operate under the tight leash of short-term relative performance and the lurking risk of dismissal. Open-end funds also appear to be a losing proposition for shareholders, who forgo the potential of larger alphas when skilled managers focus on tracking error.

Why, then, is the open-end organizational form so dominant? Perhaps investors worry that closed-end managers with long-term contracts may turn out to be incompetent. Unlike an open-end investment that can be liquidated at its underlying net asset value, closed-end investors have no recourse but to liquidate at a painful market discount to asset value, which materializes when investors lose confidence in fund managers.

Stein argued that, although open-end funds may appear to represent a socially efficient outcome, they do not. He hypothesized that "the gains from being able to undertake longer horizon trades in the closed-end form outweigh the potential losses that come from being unable to control wayward managers."²⁴ Unfortunately, as Stein explains, the efficient outcome of closed-end funds would be difficult to sustain. The best-performing managers would move from the closed-end form to

the open-end form to gain more assets under management and higher compensation. Then, other high-quality and lower-quality managers would also migrate to the open-end model to avoid losing their investors. The result would be to bring us right back to the current state of affairs, in which benchmark-sensitive managers afraid of being wrong and alone focus on short-term relative performance and the earnings number reigns supreme.

What can closed-end funds do to keep high-ability managers? The challenge is to develop incentives for closed-end funds that encourage the best managers to remain and the poor performers to leave.

- First, make total compensation, including variable performance compensation, competitive with the amount managers could earn if they moved to an open-end fund.
- Second, extend the performance measurement period to three to five years (or more). This length would give managers the freedom to be wrong and alone in the short run and time to demonstrate their skills over a longer time period. For managers who seriously underperform, the fund should be able to exercise a buyout provision.
- Third, pay annual bonuses on the basis of rolling three-year to five-year performance and motivate long-term value creation by deferring some payouts and placing them “at risk” against future performance.
- Finally, require portfolio managers to make meaningful investments in the fund.

The nearly universal use of market benchmarks reduces differences in returns between the best and worst performers because unskilled managers mask their shortcomings by closely tracking benchmarks and even skilled managers succumb to tracking, thereby concealing their skill. Benchmark tracking, along with a herdlike focus on short-term earnings, culminates in a no-free-lunch, informationally efficient market but also can produce mispricing opportunities for those willing to take the road less traveled.²⁵

The performance measurement problem for individual stock funds is not benchmarking *per se* but, rather, short-horizon benchmarking, restrictive tracking-error constraints, and benchmarks that do not provide managers sufficient investment scope to demonstrate their skills. Short-horizon benchmarking encourages managers to focus on their tracking-error risk instead of owners’ risk-adjusted long-term returns. Closet indexing is exacerbated when consultants or sponsors impose tight tracking-error con-

straints on managers. According to Grinold’s “fundamental law of active management” (see Grinold and Kahn 2000), information ratios are a function of not only skill but also the breadth of opportunities available to managers. To achieve breadth, managers must increase the number of independent alpha bets they make. Decisions are “independent” when supporting forecasts depend on different and uncorrelated sources of information. When skilled managers with a track record are identified, they should be given great breadth rather than being confined by size and style boxes.

When a fund extends the performance evaluation horizon, relaxes tracking-error restrictions, and allows greater breadth, the fund is essentially betting that the potential for increased information ratios from these policies outweighs the risk that some managers will prove to have no value-adding skills. These initiatives to increase information ratios are far more risky for open-end than for closed-end funds because short-run underperformance can trigger significant fund withdrawals from open-end funds. The widespread adoption of longer investment horizons would, however, reduce the value relevance of short-term earnings and ultimately earnings obsession.

The closed-end format for mutual funds, the four incentive features for managers outlined earlier, extended time horizons, and greater breadth represent promising steps for reducing the agency costs of delegated investment, reducing earnings obsession, and increasing allocative efficiency.

Incentives matter, but so would an increased demand for long-horizon equity funds. Consider the following possibility. Individual investors seeking professional management and diversification for the equity portion of their portfolios can choose a low-cost market index fund and/or a higher-cost fund with only a modest level of active management because of its benchmark-tracking mandate. A better asset allocation choice would be between an index fund and a long-horizon fund that is truly actively managed. This combination would enable an investor to allocate equity dollars between the two funds based on the investor’s tolerance for market-deviating returns while, at the same time, avoiding high fees for minimal active management. For example, an investor whose equity portfolio is entirely in a traditionally benchmarked fund with a targeted tracking error can replicate the tracking error by an allocation between an index fund and an actively managed long-horizon fund and save approximately 2 percent annually in fees for the portion allocated to the index fund.

Conclusion

Recent governance reforms, including the Sarbanes–Oxley Act, fail to address the root cause of recent corporate scandals—namely, the widespread obsession with short-term performance. There is no greater impediment to good corporate governance and long-term value creation than earnings obsession. There is no greater enemy of stock market allocative efficiency than earnings obsession. Alleviating earnings obsession will not eliminate the occasional madness of crowds, but sensible investors looking for excess returns will bet against the madness and hasten the return to sanity. The potential payoff from reducing short-term performance obsession in the investment and corporate communities is substantial.

Improvements in corporate reporting and incentives that more closely align the interests of

managers and owners are promising, but by no means perfect, ways of alleviating short-term performance obsession. Predicting the behavior of people who operate in a complex web of organizational relationships and an uncertain future is risky business. The incentive systems I have proposed are designed to defer a portion of investment and corporate managers' rewards until at least some of the uncertainty surrounding their performance can be resolved. The expectation is that the recommended changes will produce more owner-friendly management behavior than we have seen and a more allocatively efficient market.

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Notes

1. Sloan (1996) found that the extent to which current earnings performance persists into the future depends on the relative mix of cash flow and accrual components of current earnings. Specifically, the accrual component of earnings is less persistent than the cash flow component. Sloan found that stock prices behave as if investors, however, fixate on earnings and fail to exploit the information in the cash flow and accrual components of current earnings.
2. Ellis (2004, p. 265) estimated that, at 100 percent turnover, the typical portfolio manager is making four multimillion-dollar “to-buy or not-to-buy” and “to-sell or not-to-sell” decisions every business day of the year. Lower transaction costs and capital gains tax rates may have also contributed to shortening holding periods.
3. Keynes (1936) described a beauty contest in which contestants pick out the six prettiest faces from a hundred photos and the prize is awarded to the contestant whose choice most nearly corresponds to the *average preferences* of the group of contestants. See Chapter 12, “Long Term Expectations.”
4. I thank Shyam Sunder for discussions that helped clarify the link between the difficulty short-horizon investors face with backward induction and their turn toward projecting short-term metrics. See Hirota and Sunder (2004) for a more complete discussion.
5. *Statement of Financial Accounting Concept No. 1* states, “Financial accounting is not designed to measure directly the value of a business enterprise, but the information it provides may be helpful to those who wish to estimate its value” (FASB 1978).
6. Ordinarily, net working capital (short-term receivables minus payables) accounts for a minuscule part of the share price. Furthermore, these accruals have relatively low uncertainty. For most companies, unfunded pension and postretirement benefits represent the greatest burden on future cash flows. David Zion of Credit Suisse First Boston has estimated that unfunded balances totaled 5 percent of the S&P 500 Index market capitalization at 30 September (Zion and Carcache 2003a, 2003b).
7. Bogle (2004) estimated that mutual fund intermediation costs (advisory fees, marketing expenditures, sales loads, brokerage commissions, transaction costs, custody and legal fees, and security-processing expenses) total at least 2.5 percent of assets and consume nearly 40 percent of the 6.5 percent historical real rate of return on equities.
8. Aswath Damodaran of New York University examined 550 equity research reports between 1999 and 2001 and found that 85 percent were based on multiples and comparables. See the valuation lecture notes at www.damodaran.com.
9. Mauboussin (2002) and Surowiecki (2004) offered more optimistic views than I have presented in this section on the pricing ability of decentralized self-organizing systems.
10. Rappaport and Mauboussin (2001) illustrated this idea with a stock priced at \$80 per share, a 20 percent discount from its estimated fundamental (DCF-based) value of \$100. Assuming a 10 percent cost of equity and no change in expectations, fundamental value in one year will rise to \$110. If the \$80 stock rises to \$110 in a year, the annual return will be 37.5 percent and the excess annual return, 27.5 percent. If it takes two years to reach the target price, the excess return drops to 13.0 percent, and for three years, to 8.5 percent.
11. “Reported earnings follow the rules and principles of accounting. The results do not always create measures consistent with underlying economics. However, corporate management’s performance is generally measured by accounting income, not underlying economics. Therefore, risk management strategies are directed at accounting, rather than economic, performance” (Enron Corporation in-house risk management manual, p. 132). As quoted in McLean and Elkind (2003).
12. Missed earnings targets may also signal the presence of more serious problems because investment managers and analysts justifiably assume that all companies manage earnings and have considerable discretion in accounting that enables them to meet quarterly earnings expectations in most situations. DeGeorge, Patel, and Zeckhauser (1999) present impressive empirical evidence of earnings management.
13. The tension between earnings and shareholder value is lowest among companies with relatively small amounts of capital expenditures and R&D outlays. In such companies, the impact of current operating decisions shows up in earnings

- promptly rather than with a lag. The reverse is true in capital- and knowledge-intensive industries, such as manufacturing, pharmaceuticals, and software, where revenues lag investments by several years or more.
14. Discussion of the Corporate Performance Statement is adapted from Rappaport (2004).
 15. This section deals with incentives only for CEOs and other top executives who can affect the company's stock price. For a detailed discussion of incentives for operating units, see Rappaport (1999).
 16. Another factor, which affects shareholders but not executives' motivation, is the gap between the cost to shareholders of option grants and the grants' value to executives. The value of options to undiversified, risk-averse executives is substantially lower than the cost to shareholders. For excellent overviews of the shortcomings of traditional options, see Hall and Murphy (2003) and Hall (2003).
 17. Some observers believe that a disadvantage of indexed options is that executives profit when they outperform the index even if the stock price falls below the exercise price at grant date. To counter this objection, boards can require that options be exercised only if the company's stock is trading above its price at grant date or if it has appreciated at some minimum rate of return.
 18. For a detailed analysis of how to determine the additional shares needed, see Rappaport (1999). Concerns over dilution should not focus on the number of options granted but on the number that can be exercised in the absence of superior performance. Because executives can be rewarded for weak performance under standard plans, the risk of dilution is greater with standard plans than with indexed plans.
 19. For a discussion of discounted indexed options, see Rappaport (1999).
 20. A number of companies, including IBM Corporation, Yahoo!, Office Depot, and Electronic Data Systems Corporation, have adopted premium-priced option plans that target a higher level of performance than standard fixed-priced options. IBM, for example, announced in February 2004 that its annual grants to senior executives will have a strike price 10 percent above the market price at grant date and remain fixed over the 10-year life of the options. The share price must rise a meager 1 percent annually for executives to realize gains. Because strike prices are fixed, premium-priced options hold no guarantee that the level of required performance will turn out to be superior. During a sustained period of rising markets, such as occurred in the late 1990s, premiums of 25–50 percent on 10-year options still reward below-average performance if the stocks of peers are appreciating at a double-digit rate annually.
 21. Individual stocks can be more or less risky than the market. Companies with riskier stocks, such as high-technology companies, can choose to increase the equity risk premium or reduce the number of options granted to offset the greater value of high-volatility options.
 22. A detailed presentation of the process can be found in Rappaport and Mauboussin and at www.expectationsinvesting.com.
 23. Bernstein (2004) cited the case of Bill Miller, the legendary manager of the Legg Mason Value Trust. According to Morningstar data, Miller beat his S&P 500 benchmark and was in the top quartile of his peers every year but one from 1992 to 1999. During the falling markets between 1999 and 2002, however, despite beating his benchmark and being in the top quartile, Miller lost 42 percent of his assets.
 24. I am not aware of any studies that compare the long-term performance of open-end funds with that of closed-end funds.
 25. Bernstein (2000) argued that market indexes are floating crap games whose membership constantly changes through mergers and decisions to drop and add index companies. More importantly, because most indexes are market-value weighted, the hottest stocks acquire the greatest weight. When a relatively small number of stocks account for a significant percentage of an index, as occurred during the 1990s technology bubble, the tracking portfolio may well become much riskier than clients would prefer. Managers face a Hobson's choice of either living with a level of risk incompatible with the fund's objectives or generating an unacceptably high tracking error. Bernstein recommended that required return and tolerable risk become the performance benchmarks for calculating alphas and information ratios. Required return and risk are determined by the fund's obligations to participants, whether they are part of a corporate-sponsored pension plan or mutual fund shareholders hoping to build wealth to finance education costs or their retirement years. The problem is that the rate required to defease pension fund liabilities or fulfill the expectations of mutual fund investors will invariably be greater or less than a market-based estimate of expected rate of return. A bogey based on a fund's requirements rather than market opportunities cannot, therefore, serve as an effective measure of performance.

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