

II

Potshots at the Efficient-Market Theory and Why They Miss

The clairvoyant society of London will not meet Tuesday because of unforeseen circumstances.

—An advertisement in the *Financial Times*

During a three-week period in July 2002, the Dow Jones average of thirty industrial stocks fell 1,500 points, from 9,250 to 7,750, a decline of over 16 percent. In surveying the carnage, financial reporters were quick to point out that it wasn't quite as bad as it was fifteen years earlier, in October 1987, when the Dow lost approximately one-third of its value in a single month. This is efficient? To many observers and shocked investors, these events blatantly exposed the failings of the efficient-market theory. Did the stock market really accurately reflect all relevant information about stocks and the economy in early October 1987 or early July 2002? Had fundamental information about the economic prospects of major U.S. corporations changed enough to justify such rapid declines in the value of the Dow?

Critics believe that such events stretch the credibility of the efficient-market theory beyond the breaking point. The financial press has been unambiguous in its judgment. Just after the crash of 1987, the *Wall Street Journal* opined that the efficient-market theory was "the most remarkable error in the history of economic theory." A bit later, *BusinessWeek* described the theory as a "failure."

Certainly the behavioral theorists, whose work was

described in chapter 10, are highly skeptical that markets are efficient. The behavioralists chide their efficient-market brethren for blindly accepting that the stock market behaves rationally. Robert Shiller concluded from a longer history of stock-market fluctuations that stock prices show far “too much variability” to be explained by an efficient-market theory of pricing, and that one must look to behavioral considerations and to crowd psychology to explain the actual process of price determination in the stock market. Often these characteristics can lead to predictable patterns of stock-price movements and can be used by savvy investors to implement successful investment strategies—or so behavioralists like Richard Thaler argue.

The work of the behavioralists has been buttressed by a large number of statistical studies that confirmed several predictable patterns of stock prices. Indeed, the new mantra in the academic community is that the stock market is at least partially predictable. One of the brightest of the new wave of financial economists, Andrew Lo of the Massachusetts Institute of Technology, published a book in the late 1990s entitled *A Non-Random Walk Down Wall Street*. And in *What Works on Wall Street*, James O’Shaughnessy, a money manager with a statistical bent, documents a large number of investment strategies that he believes have “beaten” the market and can be depended on to continue to do so in the years ahead.

That’s what this chapter is about: the attempts to show that the market, as demonstrated above, is not efficient and that there is no such thing as a profitable random walk through it. I will review all the recent research proclaiming the demise of the efficient-market theory and purporting to show that market prices are, in fact, predictable. My conclusion is that such obituaries are greatly exaggerated and that the extent to which the stock market is usefully predictable has been vastly overstated. And then, when all is said and done, I will show that following the tenets of the efficient-market theory—that is, buying and holding a broad-based market index fund—is still the only game in town. Although the market may not always be rational in the short run, it always is over the long haul. That, plus the fact that no one, or no technique, can consistently predict the future, represents to me (and I hope to you) a resounding confirmation of the efficient-market approach.

What Do We Mean by Saying Markets Are Efficient?

At the outset, it is important to review what I mean by the term "efficient." I'd like to relate it to a well-known story about a finance professor and a student who come across a \$100 bill lying on the ground. As the student stops to pick it up, the professor says, "Don't bother—if it were really a \$100 bill, it wouldn't be there." The story well illustrates what financial economists usually mean when they say that markets are efficient. Markets can be efficient even if they sometimes make egregious errors in valuation, as was certainly true during the 1999–early 2000 Internet bubble. Markets can be efficient even if many market participants are quite irrational. Markets can be efficient even if stock prices exhibit greater volatility than can apparently be explained by fundamentals such as earnings and dividends. Many of us economists who believe in efficiency do so because we view markets as amazingly successful devices for reflecting new information rapidly and, for the most part, accurately. Above all, we believe that financial markets are efficient because they don't allow investors to earn above-average returns without accepting above-average risks. In short, we believe that \$100 bills are not lying around for the taking, either by the professional or the amateur investor.

While some people agree that there are no \$100 bills lying around, an even greater number insist that there's still lots of loose change. The debate on just how much loose change there is, and whether there is any dependable way to pick it up, is a subject that has made many academic careers. For the record, here's what I hold to be true, a conviction that has only grown more steadfast over time:

No one can consistently predict either the direction of the stock market or the relative attractiveness of individual stocks, and thus no one can consistently obtain better overall returns than the market. And while there are undoubtedly profitable trading opportunities that occasionally appear, these are quickly wiped out once they become known. No one person or institution has yet to produce a long-term, consistent record of finding money-making, risk-adjusted individual stock-trading opportunities, particularly if they pay taxes and incur transactions costs.

I put it more colorfully in the first edition of my book when I wrote that a blindfolded chimpanzee throwing darts at the *Wall Street Journal* could select a portfolio that would do as well as the experts. Of course, the advice was not literally to throw darts but instead to throw a towel over the stock pages—that is, to buy a broad-based index fund that simply bought and held all the stocks in the market and that charged very low expenses.

I am more convinced than ever of the wisdom of that advice, and I am persuaded that those who take potshots at the market's random walk inevitably miss their target. Or, to put it another way, the efficient-market theory is quite efficient at dodging slings and arrows.

Potshots That Completely Miss the Target

Some attempts to discredit the unpredictability of the market are so ridiculous that perhaps they should earn the sobriquet of “greater fool” theories. Among these are the Super Bowl and the Hemline indicators, both described in chapter 6. Under close examination, other picturesque potshots also misfire completely. These include the Dogs of the Dow, the January Effect, the “Thank God It’s Monday Afternoon” Pattern, and the Hot News Response.

Dogs of the Dow

This interesting strategy became popular during the mid-1990s. It capitalized on a general contrarian style of investing consistent with the idea that out-of-favor stocks eventually tend to reverse direction. The strategy entailed buying each year the ten stocks in the Dow Jones 30-Stock Industrial Average that had the highest dividend yields. The idea was that these ten stocks were the most out of favor, so they typically had low price-earnings multiples and low price-to-book-value ratios as well. The theory is attributed to a money manager named Michael O’Higgins, who publicized the technique in his book *Beating the Dow*, published in 1991. James O’Shaughnessy tested the theory as far back as the 1920s; he found that the Dogs of the Dow had beaten the overall index by about 2 to

3 percentage points per year, and argued that the strategy had not involved any additional risk.

The canine contingent of Wall Street analysts raised their ears and brought to market a large number of mutual funds based on the principle. By the mid-1990s, more than \$20 billion of investment-fund dollars were placed in Dogs of the Dow funds sold by such prestigious firms as Morgan Stanley, Dean Witter, and Merrill Lynch. And then, just as might be expected, success bit the dogs. The Dogs of the Dow consistently underperformed the overall market during the last half of the 1990s. As the "Dogs" star Michael O'Higgins opined, "the strategy became too popular" and ultimately self-destructed. The Dogs of the Dow no longer hunt.

January Effect

A number of researchers have found that January has been a very unusual month for stock-market returns. Stock-market returns have tended to be especially high during the first two weeks of January. The effect appears to be particularly strong for smaller firms. Even after adjusting for risk, small firms appear to offer investors abnormally generous returns—with the excess returns largely produced during the first few days of the year. Such an effect has also been documented for several foreign stock markets. This led to the publication of one book with the provocative title *The Incredible January Effect*. Investors and especially stockbrokers, with visions of large commissions dancing around in their heads, designed strategies to capitalize on this "anomaly" believed to be so dependable.

One possible explanation for a January Effect is that tax effects are at work. Some investors may sell securities at the end of the calendar year to establish capital losses for income tax purposes. If this selling pressure depresses stock prices, it would seem reasonable that the bounce-back during the first week in January could create abnormal returns during that period. Although this effect could be applicable for all stocks, it would be larger for small firms because stocks of small companies are more volatile and less likely to be in the portfolios of tax-exempt institutional investors and pension funds. One might suppose that traders would take advantage of any excess returns during this period. Unfortunately, however, the trans-

actions costs of trading in the stocks of small companies are substantially higher than those for larger companies (because of the higher bid-asked spreads), and there appears to be no way a commission-paying ordinary investor could exploit this anomaly. Moreover, the effect is not dependable in each year. In other words, the January "loose change" costs too much to pick up and in some years it turns out to be a mirage.

"Thank God It's Monday Afternoon" Pattern

Another "predictable" pattern, suggesting that a walk down Wall Street may not be perfectly random, is the so-called weekend effect—negative average stock returns from the close of trading on Friday to the close of trading on Monday. In other words, there is some justification for the expression "blue Monday on Wall Street." According to this line of thinking, you should buy your stocks on Monday afternoon at the close, not on Friday afternoon or Monday morning, when they tend to be selling at slightly higher prices. Again, however, the effect is small relative to the transactions cost involved to exploit it, and it is not dependable from week to week.

Hot News Response

Skeptics of the inherent unpredictability of the market often point to the fact that the market is simply incapable of quickly absorbing information and then automatically repricing itself in response. Some academics believe that stock prices underreact to news events and that, therefore, purchasing (selling) stocks where good (bad) news comes out will produce abnormal returns. Those who explore this aspect of the market are said to engage in "event studies."

Eugene Fama surveyed the considerable body of empirical work in this area to determine whether stock prices do indeed respond efficiently to information. The "events" included such announcements as earnings surprises, stock splits, dividend actions, mergers, new exchange listings, and initial public offerings. Fama found that apparent underreaction to information is about as common as overreaction, and post-event continuation of abnormal returns is as frequent as post-event reversals. He also showed that many of the return "anomalies" tend to disappear when exposed to different mod-

els for expected "normal" returns, different methods to adjust for risk, and when different statistical approaches are used to measure them. He concluded that most of the anomalies discovered by researchers "can reasonably be attributed to chance." Certainly they do not appear to offer investors a dependable way to earn abnormal returns.

Why the Aim Is So Bad

It should be obvious by now that any truly repetitive and exploitable pattern that can be discovered in the stock market and be arbitrated away will self-destruct. At one time, there may have been a truly dependable and exploitable January Effect in which the stock market—especially stocks of small companies—generated extraordinary returns during the first five days of January. What would investors do with the finding? Easy. They would buy on the last day of December, and sell on January 5. But then investors would find that the market rallied on the last day of December, and so they would need to begin to buy on the next to last day of December; and because there is so much "profit taking" on January 5, investors would have to sell on January 4 to take advantage of this effect. Thus, to beat the gun, investors will have to be buying earlier and earlier in December and selling earlier and earlier in January so that eventually the pattern would self-destruct. Indeed, the January Effect became undependable after it received considerable publicity. As one wag put it, "The January Effect sometimes occurs on the previous Thanksgiving week."

Similarly, suppose there is a general tendency for stock prices to underreact to certain new events, leading to abnormal returns to investors who exploit the lack of full immediate adjustment—a finding publicized by the behavioralists Werner De Bondt and Richard Thaler and researchers John Campbell, Andrew M. Lo, and A. Craig MacKinlay. "Quantitative" investment managers will then develop strategies in an attempt to exploit the pattern. Indeed, the more potentially profitable a discoverable pattern is, the less likely it is to survive.

Moreover, many of the predictable patterns that have been discovered may simply be the result of data mining. The ease of experimenting with financial data makes it quite likely that investigators will find some seemingly significant, but wholly

spurious, correlation between financial variables or among financial and nonfinancial data sets. Given enough time and massaging of data series, it is possible to tease almost any pattern out of most data sets. Moreover, the published literature is likely to be biased in favor of reporting such results. Significant effects are likely to be published in professional journals, while negative results, or boring confirmations of previous findings, are relegated to the file drawer or discarded. Data-mining problems are unique to nonexperimental sciences, such as financial economics, which rely on statistical analysis for their insights and cannot test hypotheses by running repeated controlled experiments.

Potshots That Get Close but Still Miss the Target

Ever mindful that they need either theories or strategies to nail down tenure or bonuses, both academics and analysts have come up with slightly more accurate shots aimed at destroying the essential unpredictability of the stock market. These can be grouped into three categories: those that seek to nail down the market's direction, those that purport to find superior longer-run market returns, and those that attempt to single out the most profitable stocks. Economists refer to the first two categories as time series strategies and include under these the Trend Is Your Friend, the Dividend Jackpot Approach, the Initial P/E Predictor, and the "Back We Go Again" Strategy. Theories in the third category come under the aegis of cross-sectional studies and include the "Smaller Is Better" Effect and the claim that Value Will Win. While all of these strategies have some merit, some more than others, not one is able consistently to penetrate the veil of unpredictability cloaking the market.

The Trend Is Your Friend (Otherwise Known as Short-Term Momentum)

The original empirical work supporting the notion of randomness in stock prices supported the view that the stock market has no memory—the way a stock price behaved in the past is not useful in divining how it will behave in the future. Just because a stock has been rising doesn't mean it will keep on ris-

ing. Several later studies have been inconsistent with this pure random-walk model. They show that there is some degree of momentum in the stock market and that price changes measured over short periods of time do tend to persist. For example, the researchers Lo and MacKinlay found that for two decades broad portfolio stock returns for weekly and monthly holding periods showed positive serial correlation. In other words, a positive return in one week is more likely than not to be followed by a positive return in the next week. Moreover, Lo and others have suggested that some of the stock-price patterns used by so-called technical analysts may actually have some modest predictive power.

Economists and psychologists in the field of behavioral finance find such short-run momentum to be consistent with psychological feedback mechanisms. Individuals see a stock price rising and are drawn into the market in a kind of "bandwagon effect." As mentioned in chapters 4 and 10, Robert Shiller described the rise in the U.S. stock market during the late 1990s as the result of psychological contagion leading to irrational exuberance. As behavioral finance became more prominent, momentum, as opposed to randomness, seemed entirely reasonable to many investigators.

I believe there are two factors that should prevent us from interpreting the empirical results reported above as an indication that markets are inefficient. While the stock market may not be a perfect random walk, it is important to distinguish statistical significance from economic significance. The statistical dependencies giving rise to momentum, in fact, are extremely small and are not likely to permit investors to realize excess returns. Anyone who pays transactions costs is unlikely to find a trading strategy based on momentum that will beat a buy-and-hold strategy. Indeed, work by another behavioral economist, Terrance Odean, suggested that momentum investors do not realize excess returns. Quite the opposite—a sample of such investors indicates that these traders did far worse than buy-and-hold investors even during a period where there was clear statistical evidence of positive momentum.

We also need to ask whether such patterns of serial correlation are consistent. Momentum strategies (buying stocks that

appear to be in an uptrend and/or displaying relative strength) appear to produce positive relative returns during some periods but highly negative ones during others. It is far from clear that any stock-price patterns are useful for investors in fashioning an investment strategy that will dependably earn excess returns.

William Schwert raises the interesting point that since many predictable patterns seem to disappear after they are published in the finance literature, they may simply reflect a bias in the data samples selected and the normal tendency of researchers to focus on results that challenge perceived wisdom. Alternatively, perhaps practitioners learn quickly about any true predictable pattern and exploit it to such an extent that it becomes no longer profitable.

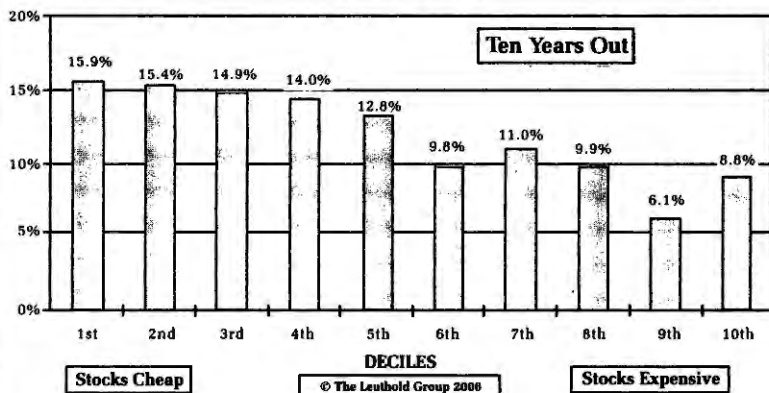
The Dividend Jackpot Approach

This technique for outguessing the market rests on the logical assumption that if stocks in general are providing above-average dividend yields, then the total future returns investors receive will be relatively generous. Two academic studies—one by Eugene Fama and Kenneth French and the other by John Campbell and Robert Shiller—concluded that one can indeed hit the jackpot with such an approach, thereby negating the randomness of the market. Depending on the forecast horizon involved, as much as 40 percent of the variability in future market returns can be predicted on the basis of the initial dividend yield of the market as a whole.

An interesting way of presenting the results is shown in the diagram below. The diagram was produced by measuring the dividend yield of the broad U.S. stock market (in this case, the Standard & Poor's 500-Stock Index) each quarter since 1926 and then calculating the market's subsequent ten-year total return through the year 2005. The observations were then divided into deciles depending upon the level of the initial dividend yield. In general, the exhibit shows that investors have earned higher total rates of return from the stock market when the initial dividend yield of the market portfolio was relatively high, and relatively low future rates of return when stocks were purchased at low dividend yields.

Future Ten-Year Rates of Return When Stocks Are Purchased at Alternative Initial Dividend Yields (D/P)

**MEDIAN TEN-YEAR ANNUAL COMPOUND
TOTAL RETURNS FROM HISTORIC D/P DECILES
1926 TO 2006**



These findings are not necessarily inconsistent with efficiency. Dividend yields of stocks tend to be high when interest rates are high, and they tend to be low when interest rates are low. Consequently, the ability of initial yields to predict returns may simply reflect the adjustment of the stock market to general economic conditions. Moreover, the dividend behavior of U.S. corporations may have changed over time. Companies in the twenty-first century may be more likely to institute a share repurchase program than to increase their dividends. Thus, dividend yield may not be as meaningful as in the past. Further, it is worth pointing out that dividend yields were unusually low and the stock market appeared irrationally exuberant at the start of 1995, when the Dow Jones Industrial Average was selling at the 5,000 level. The Dow went on to peak near 11,000, and even after the punishing decline in stock prices during the early 2000s the return from the market portfolio was still generous. Indeed, even from the time of Federal Reserve Chairman Alan Greenspan's famous "irrational exuberance" speech in

December 1996, returns from the market portfolio were approximately 8 percent during the next decade.

Finally, note that this phenomenon does not work consistently with individual stocks. Investors who simply purchase a portfolio of individual stocks with the highest dividend yields in the market will not earn a particularly high rate of return.

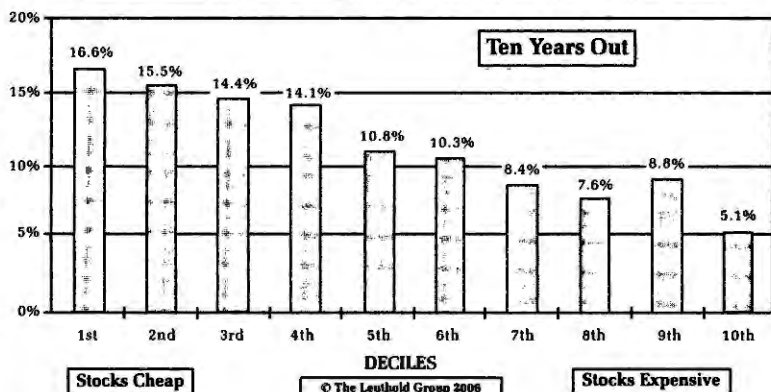
The Initial P/E Predictor

The same kind of predictability for the market as a whole, as was demonstrated for dividends, has been shown for the price-earnings ratio of the market as a whole. The data are shown below and are presented in a decile analysis similar to that described for dividend yields above. Investors have tended to earn larger future returns when purchasing stocks at relatively low price-earnings multiples. Campbell and Shiller report that over 40 percent of the variability in long-horizon returns can be predicted on the basis of the initial market P/E. They conclude that equity returns were predictable in the past to a considerable extent. As we will see in the diagram on page 263, there is also some evidence that individual stocks with low P/Es relative to the market may produce higher rates of return.

Two points should be made about these findings, which suggest a great deal of forecastability of stock prices. First, such findings may be perfectly consistent with an efficient-market view of security price determination. For example, stock prices are low relative to earnings when interest rates are high and thus required returns for all financial assets are high. P/Es were very low during the early 1980s, when U.S. government bonds had double-digit yields. Moreover, blind reliance on these patterns can lead to large investment mistakes. In 1992 the P/E for the market was unusually high (well above 20). As you can see from the diagram on page 256, the ten-year average annual rate of return was forecast to be only 5 percent. In fact, the ten-year rate of return for the S&P 500 from 1992 through 2001 was in the double digits. I have a colleague who switched his retirement plan entirely into bonds during the early 1990s because P/E ratios were so high. Over the next ten years, he was very sorry for his decision and far less certain that it is easy to predict stock returns.

Future Ten-Year Rates of Return When Stocks Are Purchased at Alternative Initial Price-to-Earnings (P/E) Multiples

**MEDIAN TEN-YEAR ANNUAL COMPOUND
TOTAL RETURNS FROM HISTORIC P/E DECILES
1926 TO 2006**



The “Back We Go Again” Strategy (Otherwise Known as Long-Run Return Reversals)

Buying stocks that performed poorly during the past three years or so is likely to give you above-average returns over the next three years. This is the finding of research carried out by Eugene Fama and Kenneth French as well as by James Poterba and Lawrence Summers and by Werner De Bondt and Richard Thaler. In research jargon, they say that although stock returns over short horizons, such as a week or a month, may be positively correlated, stock returns over longer horizons, such as two years or more, display negative serial correlation. Thus, a contrarian investment strategy—that is, buying those stocks that have had a relatively poor recent performance—might be expected to outperform a strategy of buying those stocks that recently produced superior returns. The implicit advice to investors is that the market often overreacts, as the behavioral-

ists argue, and therefore it is wise to shun fashionable stocks and concentrate on those out of favor.

Of all the predictable patterns that have been uncovered or alleged, this one strikes me not only as one of the most believable but also as potentially most beneficial for investors. Certainly, the evidence in Part One of this book shows clearly that fads and fashions can play a role in stock pricing. At times, large capitalization blue-chip stocks have been all the rage; in other periods, Internet stocks or biotechnology securities have caught investors' fancies. No matter what the fad, all carried stock prices to extremes and led to severe losses for investors who purchased at the apex. If investors could avoid buying at the top of an unwarranted bubble, serious investment mistakes could be avoided. Similarly, if those stocks that were overly popular turn out to be poor investments, perhaps the stocks that have recently been shunned by investors—the ugly ducklings of the investment world—will eventually come out from under their cloud. Particularly when such a contrarian approach is wedded to a fundamental-value approach (to avoid buying stocks simply because they are unpopular), investors may well benefit from this kind of strategy.

The behavioral explanation for such reversals in realized stock returns suggests the dominance of "castle-in-the-air" builders among investment decision makers. If stock prices were always influenced by fads and fashions that tended to arise and then decay over time, such reversals in security returns would be expected. Hence, many investigators have concluded that the evidence concerning reversals in returns is inconsistent with the efficient-market hypothesis. Well—maybe yes, but maybe no. There are both logical and statistical reasons to continue to stand by the theory of efficient markets.

Return reversals over different time periods are often rooted in solid economic facts rather than psychological swings. The volatility of interest rates constitutes a prime economic influence on share prices. Because bonds—the front-line reflectors of interest-rate direction—compete with stocks for the investor's dollars, one should logically expect systematic relationships between interest rates and stock prices. Specifically, when interest rates go up, share prices should fall, other things being the same, so as to provide larger expected stock returns

in the future. Only if this happens will stocks be competitive with higher-yielding bonds. Similarly, when interest rates fall, stocks should tend to rise, because they can promise a lower total return and still be competitive with bonds.

It's easy to see how fluctuations in interest rates can produce return reversals in stocks. Suppose interest rates go up. This may cause both bond and stock prices to fall and often produces low or negative rates of return over the time periods when the interest rates rose. Suppose now that interest rates fall back to their original level. This may cause bond and stock prices to rise and tends to produce very high returns for stockholders. Thus, over a cycle of interest-rate fluctuations, we may see relatively large stock returns following low stock returns—that is, return reversals. The point is that such return reversals need not be due to fads that decay over time. They can also result from the very logical and efficient reaction of stock-market participants to fluctuations in interest rates.

Obviously, in any given period there are many influences on stock prices apart from interest rates, so one should not expect to find a perfect correspondence between movements of interest rates and stock prices. Nevertheless, the tendency of interest rates to influence stock prices could account for return reversals, and such a relationship is perfectly consistent with the existence of efficient markets.

Statistically, there are also reasons to doubt the “robustness” of this finding concerning return reversals. Correlations of returns over time were much lower in the first half of the twentieth century than in the second. Thus, the use of simple contrarian investment strategies is no guarantee of success. And even if fads are partially responsible for some return reversals (as when a particular group of stocks comes in and out of favor), fads don't occur all the time.

Finally, it may not be possible to profit from the tendency for individual stocks to exhibit return reversals. Although such reversals may be statistically significant, they may only represent reversion to the mean rather than predictable opportunities to earn above-average returns. Zsuzsanna Fluck, Richard Quandt, and I simulated an investment strategy of buying stocks that had experienced relatively poor recent two- or three-year performance. We found that those stocks did enjoy

improved returns in the next period of time, but they recovered only to the average stock-market performance. Thus, there was a statistically strong pattern of return reversal, but not one that you could profit from. And even if the recent "losers" did produce extraordinary subsequent returns, this does not imply that stock prices systematically "overshoot" their appropriate levels. Stocks that have gone down sharply after some unfavorable business reversals exhibit heightened uncertainty and volatility and, therefore, greater risk for investors. Because investors require higher returns for bearing greater risk, a finding that future returns in these stocks are relatively generous is consistent with the efficient functioning of markets. Moreover, my belief that prices do not systematically overreact is reinforced by the fact that we do not find significant price reversals after sharp runups in prices.

So what's an investor to do? As the careful reader knows, I believe that the stock market is fundamentally logical. I also recognize that the market does sometimes get carried away with popular fads and that pessimism can also be overdone. Thus, "value" investors operating on the firm-foundation theory will often find that stocks that have produced poor recent returns may provide generous returns in the future. Knowing that careful statistical work supports this tendency, at least to some extent, should give investors an additional measure of comfort in undertaking a contrarian investment strategy coupled with a firm-foundation approach. But remember that the statistical relationship is a loose one and that some unpopular stocks may be justly unpopular and undoubtedly somewhat riskier. Certainly some companies that have been going downhill may continue to go down the tubes, as investors in Enron and WorldCom learned painfully during 2002. The relationships are sufficiently loose and uncertain that one should be very wary of expecting sure success from any simple contrarian strategy.

The "Smaller Is Better" Effect

Probably one of the strongest patterns that investigators have found in stock returns is the tendency over long periods of time for small company stocks to generate larger returns than those of large company stocks. Since 1926, small company

stocks in the United States have produced rates of return over $1\frac{1}{2}$ percentage points larger than the returns from large stocks.

The diagram on page 261 shows the work of Fama and French, who divided stocks into deciles according to their size. They found that decile 1, the 10 percent of stocks with the smallest total capitalization,* produced the largest rates of return, whereas decile 10, the largest stocks in terms of market capitalization, produced the smallest rate of return. Moreover, small firms tended to outperform larger firms with the same beta levels.

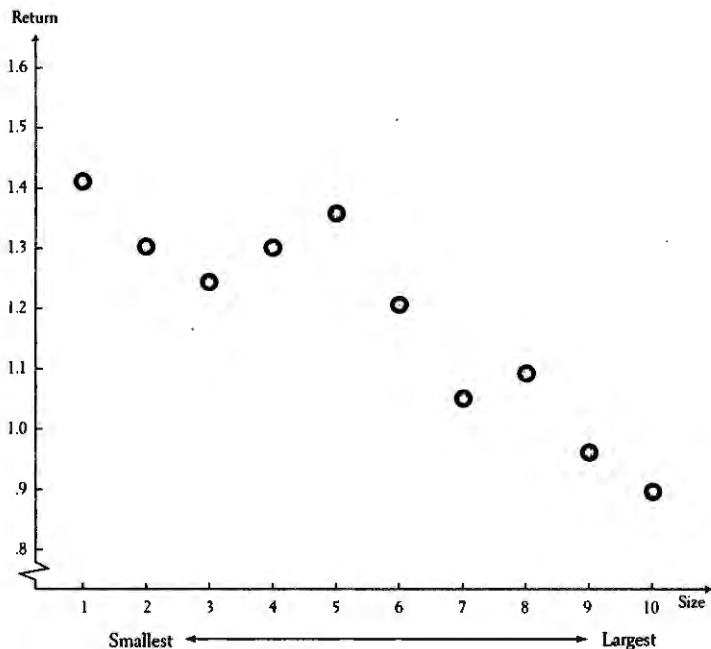
Nevertheless, we need to remember that small stocks may be riskier than larger stocks and deserve to give investors a higher rate of return. Thus, even if the "small firm effect" were to persist in the future, such a finding would not violate market efficiency. A finding that small company stocks outperform the stocks of larger companies on a risk-adjusted basis depends upon how one measures risk. We have seen that beta, the risk measure typically used in the studies that have found "excess" returns from small firms, may be an incomplete measure of risk. It is therefore impossible to distinguish whether the abnormal returns are truly the result of inefficiencies or whether they result from inadequacies in our measure of risk. The higher returns for smaller companies may simply be the requisite reward owed to investors for assuming a greater risk of disappointment in the investment returns they expect. Moreover, the small firm effect found in some studies may simply flow from what is called survivorship bias. Today's list of companies includes only small firms that have survived—not the small firms that later went bankrupt.

Finally, the dependability of the small firm effect's continuing is open to considerable question. While smaller stocks did very well during the first six years of the 2000s, there was little to gain from holding smaller stocks during the 1990s. Clearly, buying a portfolio of small firms is hardly a surefire technique to enable an investor to earn abnormally high, risk-adjusted returns.

*Total capitalization is one way to measure a company's size. It is simply the price per share multiplied by the number of shares outstanding.

Average Monthly Returns vs. Size: 1963-90

Portfolios of smaller firms have tended to produce higher rates of return than portfolios of larger firms.



Source: Fama and French, "The Cross-Section of Expected Stock Returns," *Journal of Finance* (June 1992).

The "Value Will Win" Record

In 1934, David L. Dodd and Benjamin Graham published a manifesto for investors that has attracted strong adherents, including the legendary Warren Buffett, to this day. They basically argued that "value" always wins over time. To find value, investors should look for stocks with low price-earning ratios and low prices relative to their book values. In this scenario, value is based on current realities rather than on projections of future growth. The resulting theory is consistent with the views of behavioralists (such as Kahneman and Thaler) that

investors tend to be overconfident of their ability to project high earnings growth and thus overpay for "growth" stocks.

Stocks with Low Price-Earnings Multiples Outperform Those with High Multiples

I have considerable intellectual sympathy with this approach. One of my cardinal rules of stock selection is to look for companies with good growth prospects that have yet to be discovered by the stock market and thus are selling at relatively low earnings multiples. This approach is often described as GARP, growth at a reasonable price. I have warned investors repeatedly about the dangers of very high multiple stocks that are currently fashionable. Particularly because earnings growth is so hard to forecast, it's far better to be in low-multiple stocks; if growth does materialize, both the earnings and the earnings multiple will likely increase, giving the investor a double benefit. Buying a high-multiple stock whose earnings growth fails to materialize subjects investors to a double whammy. Both the earnings and the multiple can fall.

There is some evidence that a portfolio of stocks with relatively low earnings multiples (as well as low multiples of cash flow and of sales) produces above-average rates of return even after adjustment for risk. This strategy was tested by Sanjoy Basu in the late 1970s and has been confirmed by several researchers since then. For example, the figure below shows the return from ten equal-sized groups of stocks, ranked by their P/E ratios. Group 1 had the lowest P/Es, Group 2 the second lowest, and so on. The figure shows that as the P/E of a group of stocks increased, the return decreased.

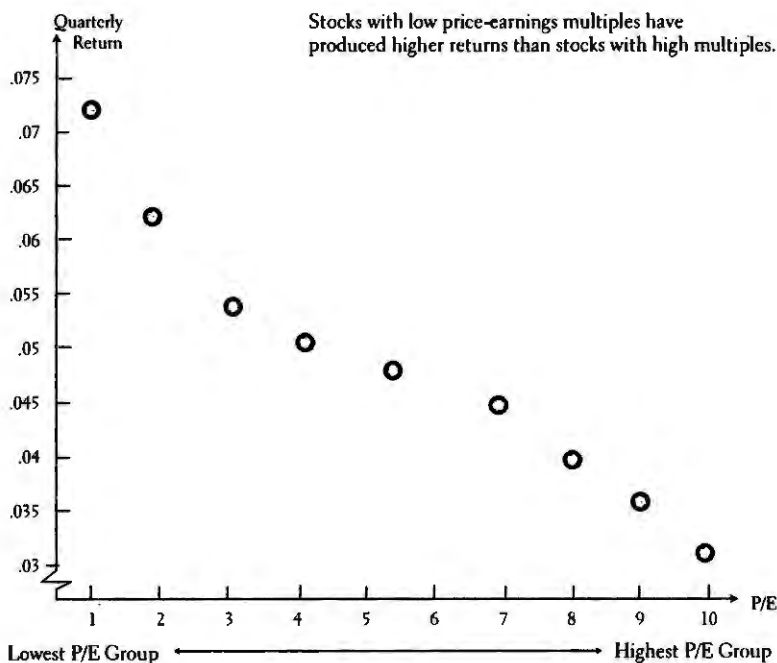
This "P/E effect," however, appears to vary over time—it is not dependable over every investment period. And even if it does persist on average over a long period of time, one can never be sure whether the excess returns are due to increased risk or to market abnormalities. The studies that have documented abnormal returns have used beta to measure risk. To the extent that beta is a far from perfect risk measure, one cannot claim that the low P/E pattern indicates a market inefficiency. And don't forget that low P/Es are often justified. Companies on the verge of some financial disaster will frequently sell at very low multiples of reported earnings. The low

multiples might reflect not value but a profound concern about the viability of the companies. And low multiples could also reflect investor concern about the accounting "quality" of the repeated earnings.

Stocks That Sell at Low Multiples of Their Book Values Tend to Produce Higher Subsequent Returns

Another predictable pattern of return is the relationship between the ratio of a stock's price to its book value (the value of the company's assets as recorded on its books) and its later return. Stocks that sell at low ratios of price to book value tend to produce higher future returns. This pattern appears to hold for both U.S. and many foreign stock markets, as has been shown by Fama and French.

Average Quarterly Returns during the 1980s vs. P/E Ratio



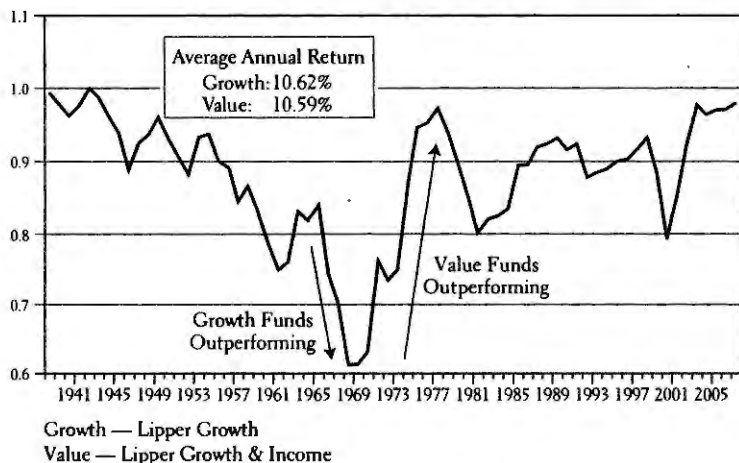
Behavioralists argue that such results raise questions about the efficiency of the market if one accepts beta as the appropriate measure of risk. But these findings do not necessarily imply inefficiency. Price-to-book-value ratios (P/BV) could reflect another risk factor that is priced into the market. Companies in some degree of financial distress are likely to sell at low prices relative to book values. Fama and French argue that a three-factor risk model (including P/BV and size as well as beta as measures of risk) is the appropriate benchmark against which any supposed inefficiencies should be measured.

But Does “Value” Really Trump Growth on a Consistent Basis?

We also must remember that the results of published studies—even those done over decades—may still be time-dependent and ask whether the return patterns of academic studies can actually be generated with real money. The chart on page 265 presents average actual returns generated by mutual funds classified by either their “growth” or “value” objectives. “Value” funds are so classified if they buy stocks with low P/E multiples and low P/BV ratios. We see that over a period running back to the 1930s, it does not appear that investors could actually have realized higher rates of return from mutual funds specializing in value stocks. Indeed, the chart suggests that the period studied by Fama and French from the early 1960s through 1990 may have been a unique period in which value stocks rather consistently produced higher rates of return.

William Schwert points out that the investment firm of Dimensional Fund Advisors actually began a mutual fund that selected value stocks quantitatively according to the Fama-French criteria. The excess-risk-adjusted return of such a portfolio was a negative 0.2 percent per month over much of the 1990s (using beta as the measure of risk). This is consistent with the results from “actively managed” value mutual funds shown in the preceding chart. To be fair, however, it should be noted that value funds did very well during the first six years of the 2000s.

Reversion to the Mean: “Growth” Funds vs. “Value” Funds, 1937–May 2006



Source: Lipper Analytic Services and Bogle Research Institute.

Why Even Close Shots Miss

Another “market pathology” often cited by behavioralists as clear evidence that markets are not efficient describes the turn-of-the-century Internet bubble examined in chapter 4. Surely, the remarkable market values assigned to Internet and related companies seem totally inconsistent with rational valuation. I sympathize with behavioralists in this instance, and in reviewing Robert Shiller’s *Irrational Exuberance*, I agreed that it was in the high-tech sector of the market that his thesis could most plausibly be supported. But even here, when we know ex post (after the collapse) that major errors were made, there were certainly no clear ex ante (while it was going on) arbitrage opportunities available to rational investors. Convinced as I was that a bubble was inflating, I did not take the risk of selling Internet stocks short, because no one could know how many greater fools would come around and push prices even higher.

Equity valuations rest on uncertain future forecasts. Even if all market participants rationally price common stocks as the present value of all expected future cash flows, it is still possible for clear excesses to develop. We know, with the benefit of hindsight, that the outlandish claims regarding the growth of the Internet (and the related telecommunications structure needed to support it) were unsupportable. We know now that projections for the rates of growth and the stability and duration of those growth rates for New Economy companies were unsustainable. But it was the sharp-penciled professional investors who argued that the valuations of high-tech companies were proper. It was a top security analyst from the venerable Wall Street firm of Morgan Stanley who became the doyenne of the Internet by recommending Net stocks to the firm's clients. And it was the professional pension-fund and mutual-fund managers who overweighted their portfolios with high-tech stocks.

While it is clear in retrospect that such professionals were egregiously wrong, there was certainly no obvious arbitrage opportunity available. One could disagree with the projected growth rates of security analysts. But who could be absolutely sure, with the use of the Internet then doubling every several months, that the extraordinary growth rates that could justify stock valuations were impossible? After all, even Alan Greenspan, then chairman of the Federal Reserve Board, was singing the praises of the New Economy. Nothing is ever as clear in prospect as it is in retrospect.

And even when clear mispricing arbitrage opportunities seem to have existed, there was no way to exploit them. Recall the illustration of 3Com spinning off 5 percent of the shares of PalmPilot stock it owned, announcing its intention to spin off the remaining 95 percent later. Irrational exuberance pushed the price of Palm's stock so high that if you bought 3Com, which still owned 95 percent of Palm, you could have effectively bought Palm stock for less than the price at which it was selling in the market. The 95 percent of Palm that 3Com owned was worth \$25 billion more than the total market capitalization of 3Com at going market prices. Here was an obvious case of mispricing and an apparently profitable arbitrage opportunity. The clear arbitrage (borrow PalmPilot stock and sell it short and buy 3Com) could not be undertaken. Not enough Palm stock

was outstanding to make it possible to borrow the stock. The “anomaly” disappeared once 3Com spun off more of Palm stock. Moreover, the potential profits from name or ticker symbol confusion described in chapter 4 were extremely small relative to the transactions costs required to exploit them. Thus, none of these illustrations should shake our faith in the long-run efficiency of our stock markets. Perhaps the more important anomaly today is why so many investors buy high-expense, actively managed mutual funds instead of low-cost index funds.

And the Winner Is . . .

It’s now time to see how the findings just discussed actually perform in practice. If predictable patterns are present and if mispricings frequently exist, then professional investment managers clearly ought to be able to use them to beat a simple index fund. So let’s take a careful look at the results racked up by professionally managed portfolios.

The Performance of Professional Investors

For me, the most convincing tests of market efficiency are direct tests of the ability of professional fund managers to outperform the market as a whole. Surely, if market prices were determined by irrational investors and systematically deviated from rational estimates of the present value of corporations, and if it was easy to spot predictable patterns in security returns or anomalous security prices, then professional fund managers should be able to beat the market. Direct tests of the actual performance of professionals, who are richly incentivized to outperform the market, should represent the most compelling evidence of market efficiency.

A remarkably large body of evidence suggests that professional investment managers are not able to outperform index funds that simply buy and hold the broad stock-market portfolio. We covered much of this work in chapter 8. For the twenty years ending December 31, 2005, the average actively managed large-capitalization mutual fund underperformed the Standard & Poor’s 500 large-cap index by almost 1½ percentage points

per year. While the index may not win in every single year, decade after decade, two-thirds or more of professionally managed funds are beaten by index funds. The table below shows the results for the periods ending in 2005. Similar results can be shown for different time periods and using different indexes for comparison. Results are also the same for international markets as well as for different asset classes such as bonds and real estate investment trusts.

Percent of Large-Cap Equity Funds Outperformed by S&P 500 for Periods Ending December 31, 2005

1 year	3 years	5 years	10 years	20 years
48%	68%	68%	79%	82%

Source: Lipper.

To be sure, there are always hot funds that beat the market in some particular period of time. And some academic studies have claimed that mutual-fund returns are predictable. They claim that funds that have been superior (inferior) performers in one period predictably perform better (or worse) in a subsequent period, at least over the near term. Thus, investors could earn significantly better returns by purchasing recently good-performing funds, apparently contradicting the efficient-market hypothesis.

Naturally, I have followed this work with great interest. And I am convinced that many studies have been flawed by the phenomenon of "survivorship bias," that is, including in their studies only the successful funds that survived over a long period of time, while excluding from the analysis all the unsuccessful funds that fell by the wayside. Commonly used data sets of mutual-fund returns, such as those available from the Morningstar Service, typically show the past records of all funds currently in existence. Clearly, today's investors are not interested in the records of funds that no longer exist. This creates the possibility of significant biases in the return figures calculated from most of the available data sets.

Mutual funds that are unsuccessful usually do not survive. You are not alone in being reluctant to buy a mutual fund with a poor record. Mutual-fund complexes (those with large numbers of funds) typically allow such a fund to suffer a painless

death by merging it into a more successful fund in the complex, thereby burying the bad fund's record. Thus, there will be a tendency for only the more successful funds to survive, and measures of the returns of such funds will tend to overstate the success of mutual-fund management. Moreover, it may appear that high returns will tend to persist. The problem for investors is that at the beginning of any period they can't be sure which funds will be successful and survive.

Another little-known factor in the behavior of mutual-fund management companies also leads to the conclusion that survivorship bias may be quite severe. A number of mutual-fund management complexes employ the practice of starting "incubator" funds. A complex may start ten small new equity funds with different in-house managers and wait to see which ones are successful. Suppose after a few years only three funds produce total returns better than the broad-market averages. The complex begins to market those successful funds aggressively, dropping the other seven and burying their records. The full records from inception of the successful funds will be the only ones to appear in the usual publications of mutual-fund returns.

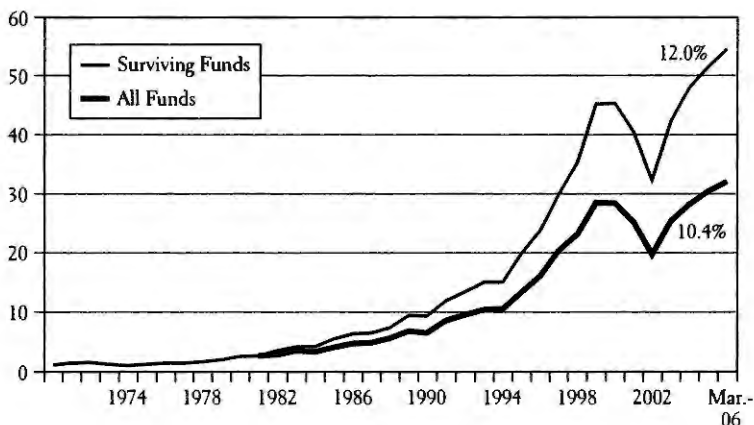
To get a handle on the possible magnitude of this bias, I obtained from Lipper Analytic Services, a company that publishes information on mutual-fund returns, more than twenty years of data on the records of all mutual funds that were available to the public each year, whether or not they survived. What I found was that surviving funds earned returns that were $1\frac{1}{2}$ percentage points greater than the returns for all mutual funds that were in existence each year. The Vanguard Group of Investment Companies plotted the data for a period of over thirty-five years. The results are shown in the preceding chart. When you read press stories of how well mutual funds do, it is likely you are seeing only the records of surviving funds. And no one knows in advance which the surviving funds will be.

When all mutual funds sold to the public are considered, the original thesis propounded by the first edition of *A Random Walk Down Wall Street* in 1973 holds up remarkably well. Over the entire thirty-five-year period since the first edition of this book, about two-thirds of the funds proved inferior to the market as a whole. The same result also holds for professional pension-fund managers, and even for highly compensated

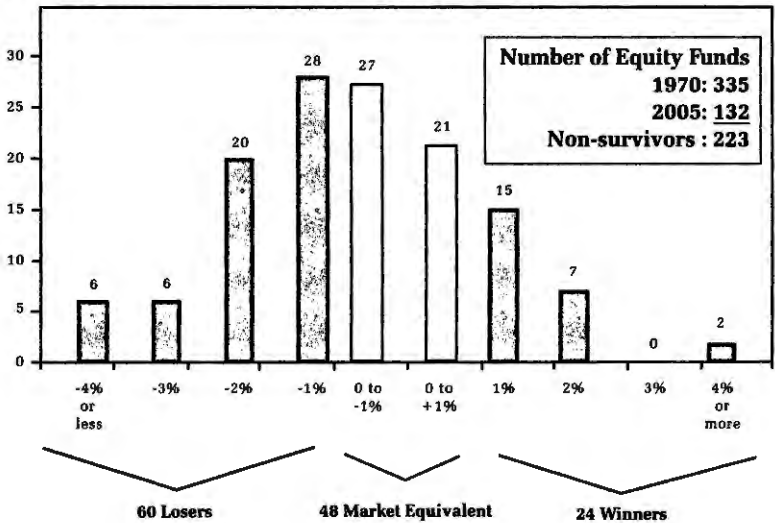
hedge-fund managers. Most equity investment managers could have substantially improved their performance by casting their lot with the efficient-market theory and not trying to outguess the market. Indeed, if the S&P index were an athlete, we would probably be testing it for steroids.

We see that managed funds are regularly outperformed by a broad index fund with equivalent risk. Moreover, as was demonstrated in chapter 8, those funds that do appear to produce excess returns in one period are not likely to do so in the next. There is no dependable persistence in performance when one considers all mutual funds, not simply the survivors. Recall that it was the hot funds of the late 1990s that failed so miserably in the early 2000s. Over the long run, the results are even more devastating to active managers. One can count on the fingers of one hand the number of professional portfolio managers who have managed to beat the market by any significant amount, as is shown in the following chart. And you can be sure the non-surviving funds did even worse. The record of professionals does not suggest that sufficient predictability exists in the stock market or that there are enough recognizable irrationalities to produce exploitable opportunities to earn excess returns over the market average.

The Survivorship Bias Effect



The Odds of Success: Returns of Surviving Mutual Funds 1970–2005



A Summing Up

I have emphasized that market valuations rest on both logical and psychological factors. The theory of valuation depends on the projection of a long-term stream of dividends whose growth rate is extraordinarily difficult to estimate. Thus, fundamental value is never a definite number. It is a fuzzy band of possible values, and prices can move sharply within this band whenever there is increased uncertainty or confusion. Moreover, the appropriate risk premiums for common equities are changeable and far from obvious either to investors or to financial economists. Thus, there is room for the hopes, fears, and favorite fashions of market participants to play a role in the valuation process. Indeed, I emphasized in early chapters how history provides extraordinary examples of markets in which psychology seemed to dominate the pricing process, as in the tulip-bulb mania in seventeenth-century Holland and the Internet bubble at the turn of the twenty-first century. I therefore harbor some doubts that we should consider that the cur-

rent array of market prices always represents the best estimate available of appropriate discounted value.

Nevertheless, one has to be impressed with the evidence suggesting that stock prices display a remarkable degree of efficiency. Information contained in past prices or any publicly available fundamental information is rapidly assimilated into market prices. Prices adjust so well to important information that a randomly selected and passively managed portfolio of stocks performs as well as or better than the portfolios selected by the experts. If some degree of mispricing exists, it does not persist for long. "True value will always out" in the stock market. To paraphrase Benjamin Graham, ultimately the market is a weighing mechanism, not a voting mechanism. Moreover, whatever mispricing there is usually is recognizable only after the fact, just as we always know Monday morning the correct play the quarterback should have called.

With respect to the evidence reviewed in this chapter indicating that future returns are somewhat predictable, there are several points to be made. First, considerable questions surround the long-run dependability of these effects. Many could be the result of "data snooping," letting the computer search through the data sets of past securities prices in the hopes of finding some relationships. With the widespread availability of computers and easily accessible stock-market data, it is not surprising that some statistically significant correlations have been found, especially because published work is probably biased in favor of reporting anomalous results rather than boring confirmations of randomness. Thus, many of the predictable patterns that have been discovered may simply be the result of data mining—beating the data set in every conceivable way until it finally confesses.

Second, even if there is a dependable predictable relationship, it may not be exploitable by investors. For example, the transaction costs involved in trying to capitalize on the January Effect are sufficiently large that the predictable pattern is not economically meaningful. Third, the predictable pattern that has been found, such as the dividend yield effect, may simply reflect general economic fluctuations in interest rates or, in the case of the small firm effect, an appropriate premium for risk. Finally, if the pattern is a true anomaly, it is likely to self-

destruct as profit-maximizing investors seek to exploit it. Indeed, the more profitable any return predictability appears to be, the less likely it is to survive.

An exchange during the 1990s between Robert Shiller, a skeptic about market efficiency, and Richard Roll, an academic economist who was also a businessman running billions of dollars of investment funds, is quite revealing. After Shiller stressed the importance of fads and inefficiencies in the pricing of stocks, Roll responded as follows:

I have personally tried to invest money, my client's money and my own, in every single anomaly and predictive device that academics have dreamed up. . . . I have attempted to exploit the so-called year-end anomalies and a whole variety of strategies supposedly documented by academic research. And I have yet to make a nickel on any of these supposed market inefficiencies. . . . I agree with Bob that investor psychology plays an important role. But, I have to keep coming back to my original point that a true market inefficiency ought to be an exploitable opportunity. If there's nothing investors can exploit in a systematic way, time in and time out, then it's very hard to say that information is not being properly incorporated into stock prices. . . . Real money investment strategies don't produce the results that academic papers say they should.

Roll's final point was underscored for me during a recent exchange I had with a portfolio manager who used the most modern quantitative methods to run his portfolio and who followed closely all the statistical work done by academics and practitioners. His method was to use, in combination, a large number of the statistical predictabilities I have outlined above. He "back-tested" his technique with historical data from the past twenty years and found that it outperformed the Standard & Poor's 500-Stock Index by three percentage points per year over the twenty-year period. But his actual results running real money were quite different. Over the next twenty-year period he barely managed to equal the S&P return after expenses. This was an extraordinary performance and ranked him in the top 10 percent of all money managers. Yet the results make clear that techniques that work on paper do not necessarily work when investing real money and incurring the transactions costs

that are involved in the real world of investing. As this portfolio manager sheepishly told me, "I have never met a back test I didn't like." But let's never forget that academic back tests are not the same thing as managing real money.

As long as there are stock markets, mistakes will be made by the collective judgment of investors. And undoubtedly, some market participants are demonstrably less than rational. As a result, pricing irregularities and predictable patterns in stock returns can appear over time and even persist for short periods. Undoubtedly, with the passage of time and with the increasing sophistication of our databases and empirical techniques, we will document further apparent departures from efficiency and further patterns in the development of stock returns. But I suspect that the end result will not be an abandonment of the belief of many in the profession that the stock market is remarkably efficient in its utilization of information and that whatever patterns or ex post irrationalities have existed are unlikely to persist and will not provide investors with a method to obtain extraordinary returns. If any \$100 bills are lying around, they will not be there for long.

A
Random
Walk
Down
Wall Street

THE TIME-TESTED STRATEGY FOR
SUCCESSFUL INVESTING

Burton G. Malkiel

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