

Malkiel: A random walk down Wall Street

change this week, and so forth. Whatever slight dependencies have been found between stock price movements in different time periods are so small that individuals who pay commission costs cannot hope to profit from them.

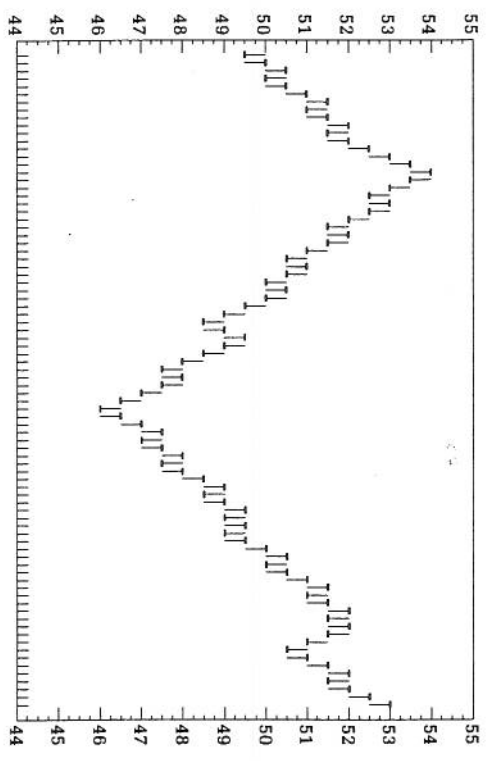
Economists have also examined the technician's thesis that there are often sequences of price changes in the same direction over several days (or several weeks or months). Stocks are likened to fullbacks who, once having gained some momentum, can be expected to carry on for a long gain. It turns out that this is simply not the case. Sometimes one gets positive price changes (rising prices) for several days in a row; but sometimes when you are flipping a fair coin you also get a long string of "heads" in a row, and you get sequences of positive (or negative) price changes no more frequently than you can expect random sequences of heads or tails in a row. What are often called "persistent patterns" in the stock market occur no more frequently than the runs of luck in the fortunes of any gambler playing a game of chance. This is what the economist means when he says that stock prices behave like a random walk.

### Just What Exactly Is a Random Walk?

To many people this appears to be arrant nonsense. Even the most casual reader of the financial pages can easily spot patterns in the market. For example, look at the stock chart on the following page.

The chart seems to display some obvious patterns. After an initial rise the stock turned down, and once the decline got under way the stock headed persistently downhill. Happily for the bulls, the decline was arrested and the stock had another sustained upward move. One cannot look at a stock chart like this without realizing the self-evidence of these statements. How can the economist be so myopic that he cannot see what is so plainly visible to the naked eye?

The persistence of this belief in repetitive patterns in the stock market is due to statistical illusion. To illustrate, let me describe an experiment in which I recently asked my students to participate. The students were asked to construct a normal stock chart showing the movements of a hypothetical stock



initially selling at \$50 per share. For each successive trading day, the closing stock price would be determined by the flip of a fair coin. If the toss was a head, the students assumed that the stock closed  $\frac{1}{2}$  point higher than the preceding close. If the flip was a tail, the price was assumed to be down by  $\frac{1}{2}$ . The chart displayed above was actually the hypothetical stock chart derived from one of these experiments.

The chart derived from random coin tossings looks remarkably like a normal stock price chart and even appears to display cycles. Of course, the pronounced "cycles" that we seem to observe in coin tossings do not occur at regular intervals as true cycles do, but neither do the ups and downs in the stock market.

It is this lack of regularity that is crucial. The "cycles" in the stock charts are no more true cycles than the runs of luck or misfortune of the ordinary gambler. And the fact that stocks seem to be in an uptrend, which looks just like the upward move in some earlier period, provides no useful information on the dependability or duration of the current uptrend. Yes, history does tend to repeat itself in the stock market, but in an infinitely surprising variety of ways that confound any attempts to profit from a knowledge of past price patterns.

In other simulated stock charts derived through student coin tossings, there were head-and-shoulders formations, tri-

ple tops and bottoms, and other more esoteric chart patterns. One of the charts showed a beautiful upward breakout from an inverted head and shoulders (a very bullish formation). I showed it to a chartist friend of mine who practically jumped out of his skin. "What is this company?" he exclaimed. "We've got to buy immediately. This pattern's a classic. There's no question the stock will be up 15 points next week." He did not respond kindly to me when I told him the chart had been produced by flipping a coin. Chartists have no sense of humor. I got my comeuppance when *BusinessWeek* hired a technician, who was adept at hatchet work, to review the first edition of this book.

My students used a completely random process to produce their stock charts. With each toss, as long as the coins used were fair, there was a 50 percent chance of heads, implying an upward move in the price of the stock, and a 50 percent chance of tails and a downward move. Even if they flip ten heads in a row, the chance of getting a head on the next toss is still 50 percent. Mathematicians call a sequence of numbers produced by a random process (such as those on our simulated stock chart) a random walk. The next move on the chart is completely unpredictable on the basis of what has happened before.

To a mathematician, the sequence of numbers recorded on a stock chart behaves no differently from that in the simulated stock charts—with one exception. There is a long-run uptrend in most averages of stock prices in line with the long-run growth of earnings and dividends. After adjusting for this trend, there is essentially no difference. The next move in a series of stock prices is unpredictable on the basis of past price behavior. No matter what wiggle or wobble the prices have made in the past, tomorrow starts out fifty-fifty. The next price change is no more predictable than the flip of a coin.

Now, in fact, the stock market does not quite measure up to the mathematician's ideal of the complete independence of present price movements from those in the past. There have been some dependencies found, as will be explained more fully in Chapter Eight. But any systematic relationships that exist are so small that they are not useful for an investor. The broker-

age changes involved in trying to take advantage of these dependencies are far greater than any advantage that might be obtained. This is the consistent finding of the academic research on stock prices. Thus, an accurate statement of the "weak" form of the random-walk hypothesis goes as follows:

The history of stock price movements contains no useful information that will enable an investor consistently to outperform a buy-and-hold strategy in managing a portfolio.

If the weak form of the random-walk hypothesis is a valid description of the stock market, then, as my colleague Richard Quandt says, "Technical analysis is akin to astrology and every bit as scientific."

I am *not* saying that technical strategies never make money. They very often do make profits. The point is rather that a simple "buy-and-hold" strategy (that is, buying a stock or group of stocks and holding on for a long period of time) typically makes as much or more money.

When scientists want to test the efficacy of some new drug they usually run an experiment where two groups of patients are administered pills—one containing the drug in question, the other a worthless placebo (a sugar pill). The results of the administration to the two groups are compared and the drug is deemed effective only if the group receiving the drug did better than the group getting the placebo. Obviously, if both groups got better in the same period of time the drug should not be given the credit, even if the patients did recover.

In the stock-market experiments, the placebo with which the technical strategies are compared is the buy-and-hold strategy. Technical schemes often do make profits for their users, but so does a buy-and-hold strategy. Indeed, as we shall see later, a naive buy-and-hold strategy using a dart-board-selected portfolio has provided investors with an average annual rate of return of approximately 10 percent over the past sixty years. I believe that return will continue at roughly that level for the remainder of the century. Only if technical schemes produce better returns than the market can they be judged effective. To date, none has consistently passed the test.

### Some More Elaborate Technical Systems

Devotees of technical analysis may argue with some justification that I have been unfair. The simple tests I have just described do not do justice to the "richness" of technical analysis. Unfortunately for the technician, even some of his more elaborate trading rules have been subjected to scientific testing. Since many of the systems tested are very popular, let's briefly examine a few in detail.

#### The Filter System

Under the popular "filter" system a stock that has reached a low point and has moved up, say 5 percent (or any other percent you wish to name here and throughout this discussion), is said to be in an uptrend. A stock that has reached a peak and has moved down 5 percent is said to be in a downtrend. You're supposed to buy any stock that has moved up 5 percent from its low and hold it until the price moves down 5 percent from a subsequent high, at which time you sell the stock and, perhaps, even sell short. The short position is maintained until the price rises at least 5 percent from a subsequent low.

This scheme is very popular with brokers, and forms of it have been recommended in a variety of investment books. Indeed, the filter method is what lies behind the popular "stop-loss" order favored by brokers, where the client is advised to sell his stock if it falls 5 percent below his purchase price to "limit his potential losses." The argument is that presumably a stock that falls by 5 percent will be going into a downtrend anyway.

Exhaustive testing of various filter rules based on past price changes has been undertaken. The percentage drop or rise that filters out buy and sell candidates has been allowed to vary from 1 percent to 50 percent. The tests covered different time periods from 1897 to the present, and involved individual stocks as well as assorted stock averages. Again, the results are remarkably consistent. When the higher brokerage commissions incurred under the filter rules are taken into consider-

ation, these techniques cannot consistently beat a policy of simply buying the individual stock (or the stock average in question) and holding it over the period during which the test is performed. The individual investor would do well to avoid employing any filter rule and, I might add, any broker who recommends it.

#### The Dow Theory

The Dow theory is a great tug-of-war between resistance and support. When the market tops out and moves down, that previous peak defines a resistance area, since people who missed selling at the top will be anxious to do so if given another opportunity. If the market then rises again and nears the previous peak, it is said to be "testing" the resistance area. Now comes the moment of truth. If the market breaks through the resistance area, it is likely to keep going up for a while and the previous resistance area becomes a support area. If, on the other hand, the market "fails to penetrate the resistance area" and instead falls through the preceding low where there was previous support, a bear-market signal is given and the investor is advised to sell.

The basic Dow principle implies a strategy of buying when the market goes higher than the last peak and selling when it sinks through the preceding valley. There are various wrinkles to the theory, such as penetration of a double or triple top being especially bullish, but the basic idea is followed by many chartists and is part of the gospel of charting.

Unhappily, the signals generated by the Dow mechanism have no significance for predicting future price movements. The market's performance after *buy* signals is no different from its performance after *sell* signals. Relative to simply buying and holding the representative list of stocks in the market averages, the Dow follower actually comes out a little behind, since the strategy entails a number of extra brokerage costs as the investor buys and sells when the strategy decrees.

### **Randomness Is Hard to Accept**

Human nature likes order; people find it hard to accept the notion of randomness. No matter what the laws of chance might tell us, we search for patterns among random events wherever they might occur—not only in the stock market but even in interpreting sporting phenomena.

In describing an outstanding performance by a basketball player, reporters and spectators alike commonly use expressions such as "Magic Johnson has the hot hand" or "Isaiah Thomas is a streak shooter." Those who play, coach, or otherwise follow basketball are almost universally convinced that if a player has successfully made his last shot, or last few shots, he is more likely to make his next shot. A 1980s study by a group of psychologists, however, proves conclusively that the "hot-hand" phenomenon is a myth.

The psychologists did a detailed study of every shot taken by the Philadelphia 76ers over a full season and a half. They found no evidence of any positive correlation between the outcomes of successive shots. Indeed, they found that a hit by a player followed by a miss was actually a bit likelier than the case of making two baskets in a row. Moreover, the researchers looked at sequences of more than two shots. Again, they found that the number of long streaks (that is, hitting of several baskets in a row) was no greater than could have been expected in a random set of data (such as flipping coins where every event was independent of its predecessor). While the event of making one's last two or three shots clearly influenced the player's perception of whether he would make his next shot, the hard evidence was that there was no effect. The researchers then confirmed their study by examining the free-throw records of the Boston Celtics and by conducting controlled shooting experiments with the men and women of the Cornell University varsity basketball teams. The outcomes of previous shots influenced players' predictions but not their performance.

These findings do not imply that basketball is a game of chance rather than skill. Obviously there are players who are more adept at making baskets and free-throws than others. The

point is, however, that the probability of making a shot is independent of the outcome of previous shots. The psychologists conjecture that the persistent belief in the hot hand could be due to memory bias. If long sequences of hits or misses are more memorable than alternating sequences, observers are likely to overestimate the correlation between successive shots. When events sometimes do come in clusters and streaks, people look for explanations and patterns. They refuse to believe that they are random even though such clusters and streaks do occur frequently in random data such as are derived from the tossing of a coin. So it is in the stock market as well.

### **A Gaggle of Other Technical Theories to Help You Lose Money**

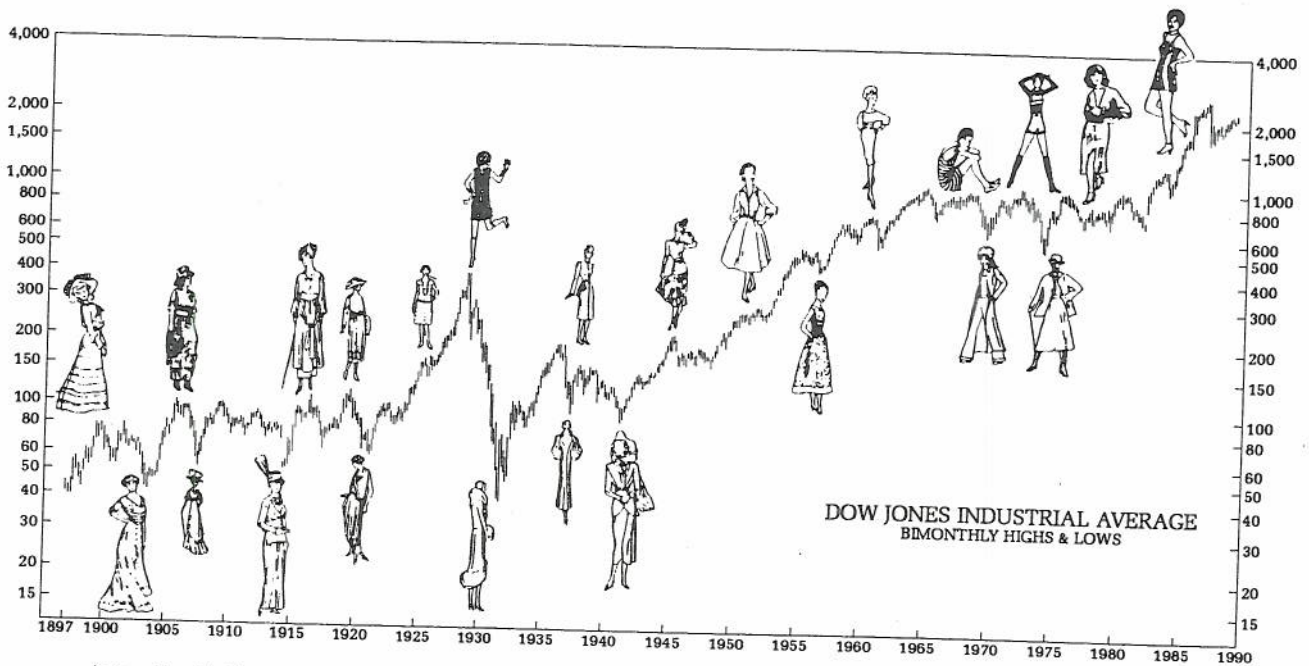
Once the academic world polished off most of the standard technical trading rules, it turned its august attention toward some of the more fanciful schemes. The world of financial analysis would be much quieter and duller without the chartists, as the following techniques amply demonstrate.

#### **The Hemline Indicator**

Not content with price movements, some technical analysts have broadened their investigations to include other movements as well. One of the most charming of these schemes has been called by Ira Cobleigh the "bull markets and bare knees" theory. Check the hemlines of women's dresses in any given year and you'll have an idea of the level of stock prices. There does seem to be a loose tendency for bull markets to be associated with bare knees, and depressed markets to be associated with bear markets for girl watchers, as the chart on the next page reveals.

For example, in the late nineteenth and early part of the twentieth centuries, the stock market was rather dull, and so were hemlines. But then came rising hemlines and the great bull market of the twenties, to be followed by long skirts and the crash of the thirties. (Actually, the chart cheats a bit: Hem-

## The Hemline Indicator



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lines fell in 1927, prior to the most dynamic phase of the bull market.)

Unfortunately, things do not work out as well in the post-World War II period. The market declined sharply during the summer of 1946, well in advance of the introduction of the "New Look" featuring longer skirt lengths in 1947. Similarly, the sharp stock-market decline that began at the end of 1968 preceded the introduction of the midi-skirt, which was high fashion in 1969 and especially in 1970.

How did the theory work out during the crash of 1987? Looking at the chart, you might think the hemline indicator failed. After all, in the spring of 1987, when designers began shipping their fall lines, very short skirts were decreed as the fashion for the time. But along about the beginning of October, when the first chill winds began blowing across the country, a strange thing happened: Most women decided that mini-skirts were not for them. As women went back to long skirts, designers quickly followed Bill Blass. "Short skirts now look ridiculous to me," declared Bill Blass. The rest is stock-market history. Now we know the real culprit for the stock-market crash of 1987.

But don't get too optimistic about using the hemline indicator to give you a leg up on market timing. There is a problem for those who seriously would try to project these relationships into the future. While there is no theoretical ceiling on stock prices, there obviously is a ceiling on dress heights. Perhaps the advent of fanny-high micro-mini-skirts and hot pants during the early 1970s indicated that this stock-market theory had gone about as far as it could.

### The Super Bowl Indicator

Why did the market rally in 1989? That's easy to answer for a technical analyst who uses the Super Bowl indicator. The Super Bowl indicator forecasts how the stock market will perform based on which team wins the Super Bowl. A victory by an NFL team predicts a bull market in stocks whereas a victory by an AFL team is bad news for stock-market investors. Since the San Francisco Forty-niners defeated the Cincinnati Bengals in 1989, the auguries for a stock-market boom were good; again,

the market responded correctly by rising smartly during the first half of the year. In the twenty years following the first Super Bowl, this indicator has only been wrong twice. It failed in 1970 when the Kansas City Chiefs' (AFL) victory was followed by a bull market in stocks and in 1987 when a victory by the New York Giants (NFL) was followed by the stock-market crash (although the market did end 1987 higher than it started). Naturally, it makes no sense that the results of the Super Bowl should be useful as a market forecaster. Nevertheless, chance correlations will always pop up. The success of the Super Bowl indicator simply illustrates nothing more than the fact that it's sometimes possible to correlate two completely unrelated events.

### The Odd-Lot Theory

This theory holds that except for the man who is always right, no person can contribute more to successful investment strategy than a man who is known to be invariably wrong. The "odd-lotter," according to popular superstition, is precisely that kind of person. Thus success is assured by buying when the odd-lotter sells and selling when the odd-lotter buys.

Odd-lotters are the people who trade stocks in less than 100-share lots (called round lots). Most amateurs in the stock market cannot afford the \$5,000 investment to buy a round lot (100 shares) of stock selling at \$50 a share. They are more likely to buy, say, ten shares for a more modest investment of \$500.

By examining the ratio of odd-lot purchases (the number of shares these amateurs bought during a particular day) to odd-lot sales (the number of shares they sold) and by looking at what particular stocks odd-lotters buy and sell, one can supposedly make money. These uninformed amateurs, presumably acting solely out of emotion and not with professional insight, are lambs in the street being led to slaughter. They are, according to legend, invariably wrong.

It turns out that the odd-lotter isn't such a stupendous dodo after all. A little stupid? Maybe. There is some indication that the performance of odd-lotters might be slightly worse than the stock averages. However, the available evidence (which ad-

mittedly does not match what has been accumulated in testing many of the other technical strategies) indicates that knowledge of his actions is not useful for the formulation of investment strategies.

One of the available studies examines the theory that an investor can make use of data on odd-lot sales and odd-lot purchases in selecting stocks. Supposedly, a switch from net odd-lot buying (where odd-lot shares purchased exceed odd-lot shares sold) to net odd-lot selling (odd-lot sales greater than odd-lot purchases) should be taken as a "buy" signal, since the boobs who sell odd-lots obviously don't know what they're doing. The data did not support this contention. Indeed, the rule failed to indicate the major turning points for individual stocks or for the market as a whole. Moreover, the odd-lot index was a very volatile one, switching back and forth from net sales to net purchases quite frequently. This suggests that an investor who followed the strategy would incur very heavy brokerage charges, which would eat substantially into his capital.

With the exception of a few technicians who sell their services to the public, few professional investment people believe in the odd-lot theory anymore. Indeed, some professional investors have seriously suggested that a new odd-lot theory is applicable to today's institutionally dominated market. Instead of looking at the behavior of the little guy in the market, it is suggested that the yo-yos who run the big mutual funds are the odd-lotters of today, and that investors should look at what they are doing and then do the opposite.

### A Few More Systems

To continue this review of technical schemes would soon generate rapidly diminishing returns. Probably few people seriously believe that the sunspot theory of stock-market movements can make money for them. But do you believe that by following the ratio of advancing to declining stocks on the New York Stock Exchange you can find a reliable leading indicator of general stock-market peaks? A careful computer study says no. Do you think that a rise in short interest (the number of

vice-president of the investment firm of Shearson, Lehman, Hutton. Garzarelli was not a one-indicator woman. She plunged into the ocean of financial data and used no fewer than thirteen different indicators to predict the course of the market. Garzarelli always liked to study vital details. As a child, she would get animal organs from the local butcher and dissect them.

Garzarelli was the Roger Babson of the 1987 crash. Turning bearish in August, she was recommending by September 1 that her clients get completely out of the stock market. By October 11 she was almost certain that a crash was imminent. Two days later, in a forecast almost frighteningly prescient, she told *USA Today* that a drop of more than 500 points in the Dow Jones averages was coming. Within a week, her predictions were realized.

But the crash was Garzarelli's last hurrah. Just as the media were coronating her as the "Guru of Black Monday," and as adulatory articles appeared in magazines from *Cosmopolitan* to *Fortune*, she drowned in her prescience—or her notoriety. After the crash she said she wouldn't touch the market and predicted that the Dow would fall another 200 to 400 points. Thus, Garzarelli missed the bounce-back in the market and the funds she managed underperformed the indices badly during 1988. In explaining her lack of consistency, she gave the time-honored explanation of technicians: "I failed to believe my own charts."

The moral to the story is obvious. With large numbers of people predicting the market, there will always be some who have called the last turn or even the last few turns, but none will be consistently accurate. To paraphrase the biblical warning, "He who looks back at the predictions of market gurus dies of remorse."

### Why Are Technicians Still Hired?

It seems very clear that under scientific scrutiny chart-reading must share a pedestal with alchemy. There has been a remarkable uniformity in the conclusions of all studies done on

all forms of technical analysis. Not one has consistently outperformed the placebo of a buy-and-hold strategy. Technical methods cannot be used to make useful investment strategies. This is the fundamental conclusion of the random-walk theory.

A former colleague of mine, who believed that the capitalist system would be sure to weed out all useless growths such as the flourishing technicians, was convinced that the technical cult was just a passing fad. "The days of these modern-day soothsayers on Wall Street are numbered," he would say. "Brokers will soon learn they can easily do without the technicians' services."

The charitist's durability, and the fact that over the years he has been hired in increasing numbers, suggests that the capitalist system may garden like most of the rest of us. We like to see our best plants grow, but as summer wears on somehow the weeds often manage to get the best of us. And as I often tell my wife when she remarks about the abundance of weeds in our lawn, "At least they're green."

The point is, the technicians often play an important role in the greening of the brokers. Chartists recommend trades—almost every technical system involves some degree of in-and-out trading. Trading generates commissions, and commissions are the lifeblood of the brokerage business. The technicians do not help produce yachts for the customers, but they do help generate the trading that provides yachts for the brokers. Until the public catches on to this bit of trickery, technicians will continue to flourish.

### Appraising the Counterattack

As you might imagine, the random-walk theory's dismissal of charting is not altogether popular among technicians. Academic proponents of the theory are greeted in some Wall Street quarters with as much enthusiasm as Yasir Arafat addressing a meeting of the B'nai B'rith. Technical analysts consider the theory and its implications to be, in the words of one veteran professional, "just plain academic drivel." Let us pause, then, and appraise the counterattack by beleaguered technicians.

Perhaps the most common complaint about the weakness of the random-walk theory is based on a distrust of mathematics and a misconception of what the theory means. "The market isn't random," the complaint goes, "and no mathematician is going to convince me it is." Even so astute a commentator on the Wall Street scene as "Adam Smith" displays this misconception when he writes:

I suspect that even if the random walkers announced a perfect mathematical proof of randomness I would go on believing that in the long run future earnings influence present value, and that in the short run the dominant factor is the elusive *Aus-tralopithecus*, the temper of the crowd.

Of course earnings and dividends influence market prices, and so does the temper of the crowd. We saw ample evidence of this in earlier chapters of the book. But, even if markets were dominated during certain periods by irrational crowd behavior, the stock market might still well be approximated by a random walk. The original illustrative analogy of a random walk concerned a drunken man staggering around an empty field. He is not rational, but he's not predictable either.

Moreover, new fundamental information about a company (a big mineral strike, the death of the president, etc.) is also unpredictable. It will occur randomly over time. Indeed, successive appearances of news items must be random. If an item of news were not random, that is, if it were *dependent* on an earlier item of news, then it wouldn't be news at all. The weak form of the random-walk theory says only that stock prices cannot be predicted on the basis of past stock prices. Thus criticisms of the type quoted above are not valid.

The technical analyst will also cite chapter and verse that the academic world has certainly not tested every technical scheme that has been devised. That is quite correct. No economist or mathematician, however skillful, can prove conclusively that technical methods can never work. All that can be said is that the small amount of information contained in stock-market pricing patterns has not been shown to be sufficient to overcome the brokerage costs involved in acting on that information. Consequently, I have received a flood of letters con-

demning me for not mentioning, in my earlier editions of this book, a pet technical scheme that the writer is convinced actually works.

Being somewhat incautious, I will climb out on a limb and argue that no technical scheme whatever could work for any length of time. I suggest first that methods which people are convinced "really work" have not been adequately tested; and second, that even if they did work the schemes would be bound to destroy themselves.

Each year a number of eager people visit the gambling parlors of Las Vegas and Atlantic City and examine the last hundreds of numbers of the roulette wheel in search of some repeating pattern. Usually they find one. And so they stay until they lose everything because they do not retest the pattern.\* The same thing is true for technicians.

If you examine past stock prices in any given period, you can almost always find some kind of system that would have worked in a given period. If enough different criteria for selecting stocks are tried, one will eventually be found that selects the best ones of that period.

Let me illustrate. Suppose we examine the record of stock prices and volume over the five-year period 1985 through 1989 in search of technical trading rules that would have worked during that period. After the fact it is always possible to find a technical rule that works. For example, it might be that you should have bought all stocks whose names began with the letters X or I, whose volume was at least 3,000 shares a day, and whose earnings grew at a rate of 10 percent or more during the preceding five-year period. The point is that it is obviously possible to describe, after the fact, which categories of stocks had the best performance. The real problem is, of course, whether the scheme works in a different time period. What most advocates of technical analysis usually fail to do is to test their schemes with market data derived from periods other than those during which the scheme was developed.

\* Edward O. Thorp actually did find a method to win at blackjack. Thorp wrote it all up in *Beat the Dealer*. Since then casinos switched to the use of several decks of cards in order to make it more difficult for card counters, and as a last resort, they banish the counters from the gaming tables.



Even if the technician follows my advice, tests his scheme in many different time periods, and finds it a reliable predictor of stock prices, I still believe that technical analysis must ultimately be worthless. For the sake of argument, suppose the technician had found that there was a reliable year-end rally, that is, every year stock prices rose between Christmas and New Year's Day. The problem is that once such a regularity is known to market participants, people will act in a way that prevents it from happening in the future.\*

Any successful technical scheme must ultimately be self-defeating. The moment I realize that prices will be higher after New Year's Day than they are before Christmas I will start buying before Christmas ever comes around. If people know a stock will go up *tomorrow*, you can be sure it will go up *today*. Any regularity in the stock market that can be discovered and acted upon profitably is bound to destroy itself. This is the fundamental reason why I am convinced that no one will be successful in employing technical methods to get above-average returns in the stock market.

### Implications for Investors

The past history of stock prices cannot be used to predict the future in any meaningful way. Technical strategies are usually amusing, often comforting, but of no real value. This is the weak form of the random-walk theory, and it is the consistent conclusion of research done at universities such as Chicago, M.I.T., Yale, Princeton, and Stanford. It has been published mainly in investment journals, but also in more esoteric ones such as *Kyklos* and *Econometrica*. Technical theories enrich only the people preparing and marketing the technical service or the brokerage firms who hire technicians in the hope that their analyses may help encourage investors to do more in-and-out trading and thus generate commission business for the brokerage firm.

\*If such a regularity was known to only one individual, he would simply practice the technique until he had collected a large share of the marbles. He surely would have no incentive to share a truly useful scheme by making it available to others.

The implications of this analysis are simple. If past prices contain no useful information for the prediction of future prices, there is no point in following any technical trading rule for timing the purchases and sales of securities. A simple policy of buying and holding will be at least as good as any technical procedure. Discontinue your subscriptions to worthless technical services, and eschew brokers who read charts and are continually recommending the purchase or sale of securities.

There is another major advantage to a buy-and-hold strategy that I have not yet mentioned. Buying and selling, to the extent that it is profitable at all, tends to generate capital gains, which, in the late 1980s, were taxed at regular income-tax rates. Buying and holding enables you to postpone or avoid gains taxes. By following any technical strategy, you are likely to realize most of your capital gains and pay larger taxes (as well as paying them sooner) than you would under a buy-and-hold strategy. Thus simply buying and holding a diversified portfolio suited to your objectives will enable you to save on investment expense, brokerage charges, and taxes; and, at the same time, to achieve an overall performance record at least as good as that obtainable using technical methods.