

A report on the performance  
of 57 funds and their sensi-  
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# Can Mutual Funds Outguess the Market?

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Are mutual fund managers successfully anticipating major turns in the stock market? There is a widely held belief that they are. Whether investment managers themselves actually share this belief is hard to say. At one time or another in promoting their services, however, a number of mutual funds have used the claim that they can anticipate major stock market movements.

We have devised a statistical test of mutual funds' historical success in anticipating major turns in the stock market. Applying this test to the performance record of 57 open-end mutual funds (as reported in this article), we find no evidence to support the belief that mutual fund managers can outguess the market.

## Debated Responsibilities

The question we have studied has an important bearing on the responsibilities which investment managers can properly be asked to assume. For instance, today almost everyone agrees that the market was dangerously high in early 1929 and that stocks were a bargain in the 1950's. On hindsight, laymen are tempted to think that these extremes should have been "obvious" to fund managers at the time, and that they should have sold or bought common stocks accordingly. In actuality, of course, fund managers did *not* always sell in 1929 and buy in the 1950's.

What position should the fund manager take

to protect himself against accusations that he should have anticipated market movements in this way? More broadly, what does the shareholder have a right to expect from the fund manager? Is the fund manager speculating if he attempts to anticipate major market movements? Or is he negligent if he fails to try? It seems to us that the answers to these questions depend in part on whether or not investment managers actually have the *ability* to anticipate major turns in the stock market.

Because a mutual fund's performance in each succeeding year is readily measured, widely published, and easily compared with that of other mutual funds, managers in this industry are perhaps particularly sensitive to the effect on their funds' performance of a market decline or market rise during the year. We believe that our findings may have significance not only for mutual fund managers, but also for pension, trust, and endowment fund managers — despite the fact that their objectives vary widely. If it is generally true that investment managers cannot outguess the market, then it may be necessary to revise certain conceptions about the responsibilities of investment management across the board.

## Analytical Approach

It is well known that there is a definite tendency for the prices of most common stocks to move up and down together. Because this tendency exists, it is meaningful to talk about fluctuations in the "market." It is also well known

that some common stocks are more volatile (i.e., sensitive to market fluctuations) than others.

Thus, when we talk about investment managers outguessing the market, we mean anticipating whether the general stock market is going to rise or fall and adjusting the composition of their portfolios accordingly. That is, if they think the market is going to fall, they shift the composition of the portfolios they manage from more to less volatile securities (including bonds). If they think the market is going to rise, they shift in the opposite direction. The result of such shifts is a change in effective *portfolio* volatility. (A simple graphical measure of portfolio volatility was developed by one of the authors in a previous HBR article,<sup>1</sup> and is reviewed in some detail later in this article.)

In order to test whether or not a mutual fund manager has actually outguessed the market, we ask, in effect: *Is there evidence that the volatility of the fund was higher in years when the market did well than in years when the market did badly?* This is the question that was applied to the 57 funds we studied. Of course, we did not know that *all* of them were trying to outguess the market, but that does not matter. Unquestionably, some of them were trying to do this and thought they had the ability.

### Performance Data Used

Data for the mutual funds in our sample were obtained from *Investment Companies 1963*, by Arthur Wiesenberger Company.<sup>2</sup> For open-end investment companies, Wiesenberger employs the following formula to compute rate of return: "To asset value per share at the end of the period, adjusted to reflect reinvestment of all capital gains distributions, add dividends per share paid during the period from investment income, similarly adjusted; divide the total by the starting per share asset value."<sup>3</sup>

The resulting rate-of-return figure is only approximate, since it disregards subtleties relating to (1) the timing within the period of dividend distributions and (2) the relative after-tax value to the shareholder of market appreciation, on the one hand, and of dividend-interest income, on the other. We feel, however, that the measure is probably adequate for our purpose, even though these effects are disregarded.

### The Characteristic Line

If, year by year, the rate of return for a managed fund is plotted against the rate of return,

similarly defined, for a suitable market average — such as the Dow-Jones Industrial Average or the Standard & Poor's 500-Stock Index — the result is the kind of patterns shown in EXHIBIT 1. A line fitting the pattern is called the characteristic line. If the line has the same slope for years in which the market goes up as for years in which the market goes down, the slope of the line is constant; the line is straight. When this is so, a single number — the tangent of the slope angle of the line — is sufficient to characterize the sensitivity of the fund in question to market fluctuations, and we can talk meaningfully about "the" volatility of the line.

The fund shown in Part A of EXHIBIT 1 has kept a constant volatility over the years included in the sample. For such funds, the degree of scatter around the characteristic line is a measure of how well diversified the fund is. The more nearly perfect the diversification of the fund, the less scatter around the characteristic line, because the more accurately the fund reflects the stocks in the market average.

### Outguessing the Market

What happens, however, if a fund management tries continually to outguess the market by oscillating between two characteristic lines, one of which has a high volatility and the other, a low volatility?

Part B of EXHIBIT 1 illustrates the extreme case in which management is able to outguess the market at every turn. Whenever management has elected the highly volatile composition demonstrated by characteristic line C-D, the market has risen; whenever management has elected the low-volatility line A-B, the market has fallen. It is clear in this case that the characteristic line is no longer straight.

If, on the other hand, fund management guesses wrong as often as it guesses right, then we have the kind of picture shown as Part C of EXHIBIT 1. Here the fund's performance traces out the undesirable points H, G, F, and E as frequently as it traces out the desirable points A, B, C, and D. The result is considerable scatter in the characteristic-line pattern, *but no curvature*.

Probably no fund management would claim

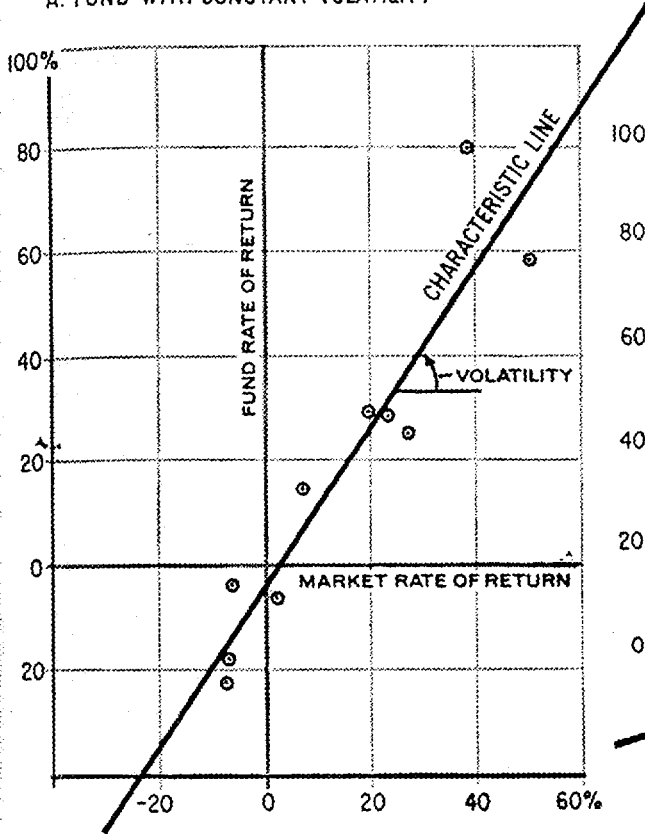
<sup>1</sup> Jack L. Treynor, "How to Rate Management of Investment Funds," HBR January-February 1965, p. 63.

<sup>2</sup> Port Washington, New York, Kennikat Press, Inc., 1963.

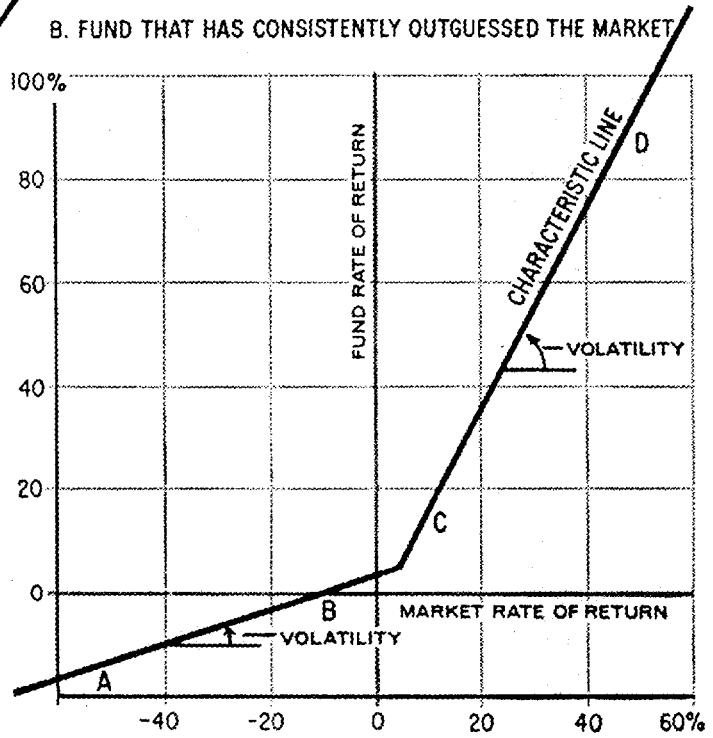
<sup>3</sup> *Ibid.*, p. 99.

EXHIBIT I. ILLUSTRATIVE CHARACTERISTIC LINES

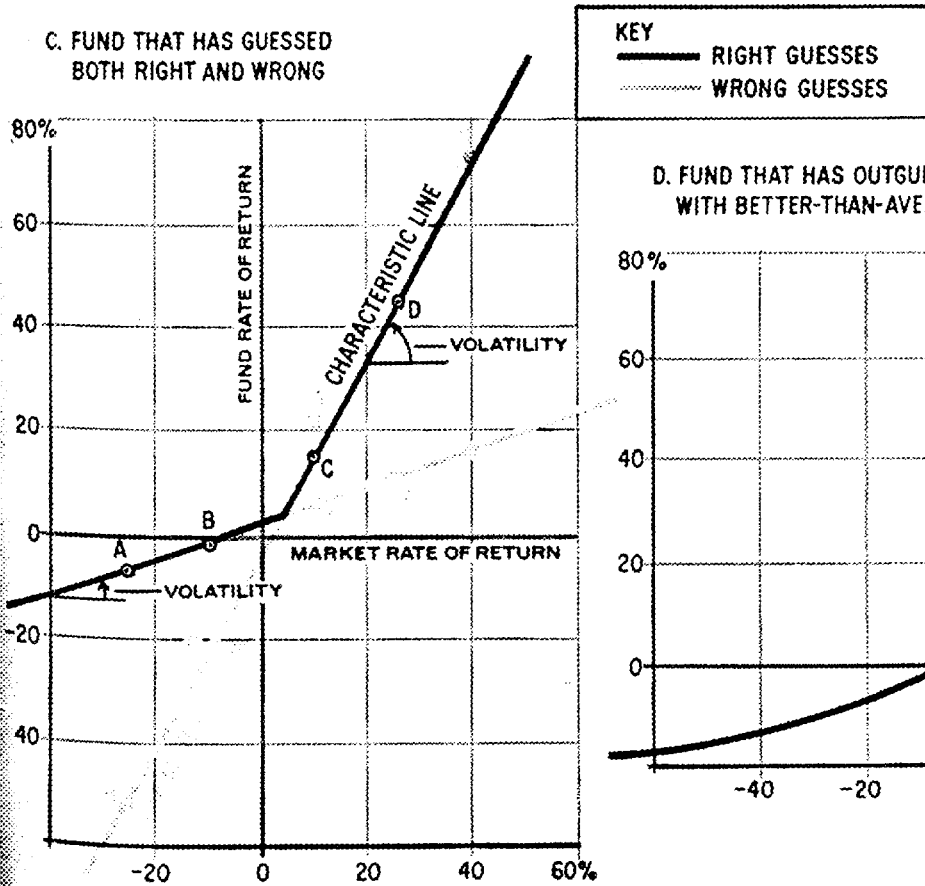
A. FUND WITH CONSTANT VOLATILITY



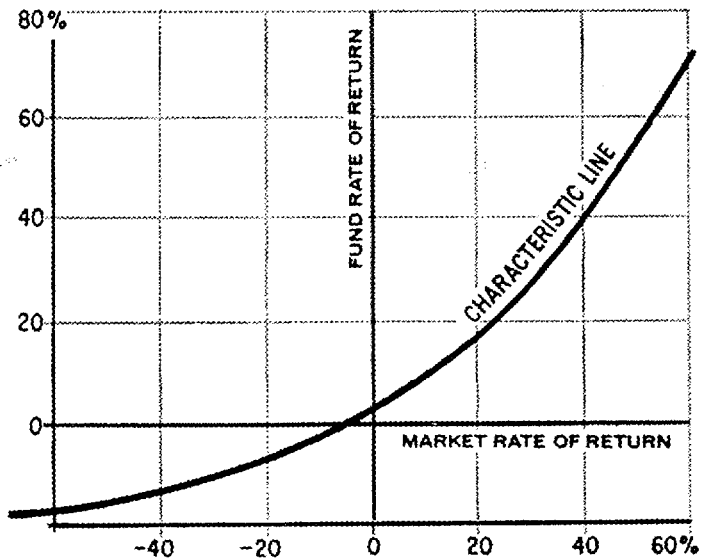
B. FUND THAT HAS CONSISTENTLY OUTGUESSED THE MARKET



C. FUND THAT HAS GUESSED BOTH RIGHT AND WRONG



D. FUND THAT HAS OUTGUESSED THE MARKET WITH BETTER-THAN-AVERAGE SUCCESS



to be able to anticipate the market perfectly. Let us assume, however, that management has some prediction powers. Then, the better the market performs, the more likely management is to have anticipated good performance and to have increased fund volatility appropriately; and the larger, on the average, the chosen volatility is likely to be. The result will be a gradual transition of fund volatility from a flat slope at the extreme left of the characteristic-line diagram to a steep slope at the extreme right, with the slope varying more or less continuously in between, producing a smoothly curved characteristic line pattern with a certain amount of scatter resulting from management's bad predictions (see Part D of EXHIBIT 1) rather than the kinked pattern associated with the policy illustrated in EXHIBIT 1-B.

The key to our test for successful anticipation is simple: the only way in which fund management can translate ability to outguess the market into a benefit to the shareholder is to vary the fund volatility systematically in such a fashion that the resulting characteristic line is concave upward, as in EXHIBIT 1-D. If fund management has correctly anticipated the market more often than not, then the characteristic line will no longer be straight. (And we can add, for the more mathematically inclined reader, that whether the characteristic line is smoothly curved or kinked, a least-squares statistical fit of a characteristic line to the performance data for the fund will be improved by inclusion of a quadratic term in the fitting formula.)

### Choice of Funds

If the management of a balanced fund elects to change the fund's volatility, it can shift the relative proportions of debt and equity, or change the average volatility of the equity portion, or both. However, stock funds and growth funds, which are commonly considered to consist primarily of equity securities, are obviously not free to alter their volatilities by shifting the relative proportions of debt and equity (although they can alter the average volatility of the common stocks held). For this reason, it is sometimes argued that a balanced fund is more likely to make frequent changes in fund volatility. To allow for this possibility, we divided our sample in roughly equal proportions between balanced and growth funds.

In addition, it is sometimes argued that smaller funds will have less difficulty in changing

their portfolio composition quickly when a change in volatility is desired. To account for this, we included in our sample of 57 mutual funds a wide range of fund sizes. EXHIBIT II shows the distribution of our sample among

EXHIBIT II. BREAKDOWN OF SAMPLE BY SIZE AND TYPE OF FUND

Market value of assets*	Number of funds		
	Growth	Balanced	Total
Less than \$20	7	10	17
\$20-\$99	7	13	20
\$100-\$500	10	7	17
More than \$7,500	1	2	3
Total	25	32	57

\* In millions of dollars as of December 31, 1962.

fund sizes and between balanced funds and growth funds.

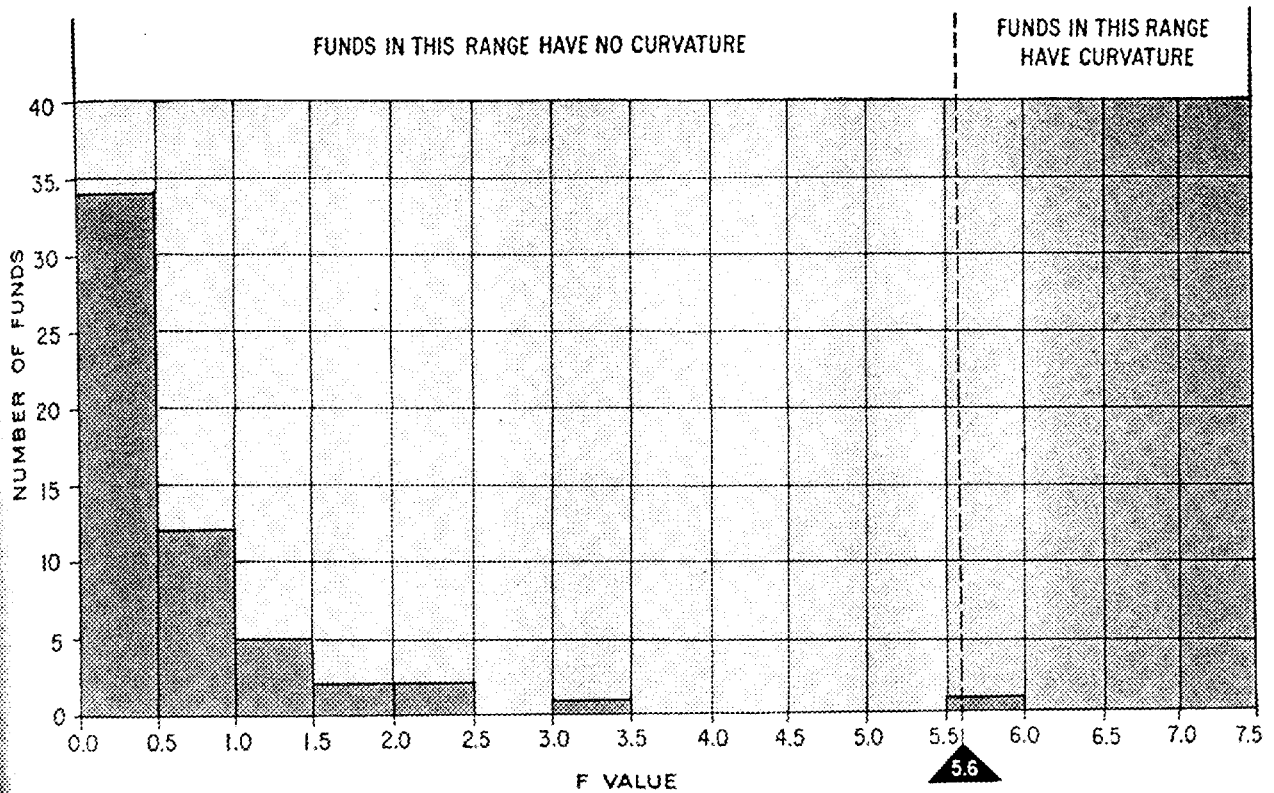
### Time Period Studied

The period covered in the study includes the ten years beginning in 1953 and ending in 1962. One may ask if our findings would have been different if another time period had been selected for study. We do not think so. Subject to the various sources of random scatter in characteristic-line patterns discussed previously, the characteristic-line pattern remains invariant over time, regardless of the behavior of the market, unless and until basic management policies or abilities change. (In fact, management policies and abilities are probably drifting slowly as individual men in the management team mature and as the composition of the management team changes, but these effects are usually small, compared to the effects on the year-to-year rate of return caused by market fluctuations.)

As mentioned earlier, if management is right more often than wrong in its attempts to outguess the market, the characteristic-line pattern will be curved. The degree of curvature depends on how heavily management bets on its expectations — that is, the degree to which management changes fund volatility when its expectations regarding the market change. So long as management policy continues roughly constant in this regard, the degree of curvature manifested in the characteristic line will remain unchanged.

The only criterion for the time period selected for a curvature study is that during the period the market should have exhibited wide and frequent swings both upward and downward, so that the characteristic-line data are not confined

EXHIBIT III. DISTRIBUTION OF FUNDS ACCORDING TO F VALUE



### Findings

What does the study show? It shows no statistical evidence that the investment managers of any of the 57 funds have successfully out-guessed the market. More precisely, we find no evidence of curvature of the characteristic lines of any of the funds.

Here are some of the more technical aspects of our study:

• In order to test for the presence of curvature, we used the methods mentioned earlier. (A least-squares regression technique was employed to fit characteristic-line data for the 57 open-end mutual funds in our sample. That is, for each of the funds we calculated the constants for the equation which "best" describes the performance data of the mutual fund for the Standard & Poor's Composite Price Index as a quadratic function of the performance.)

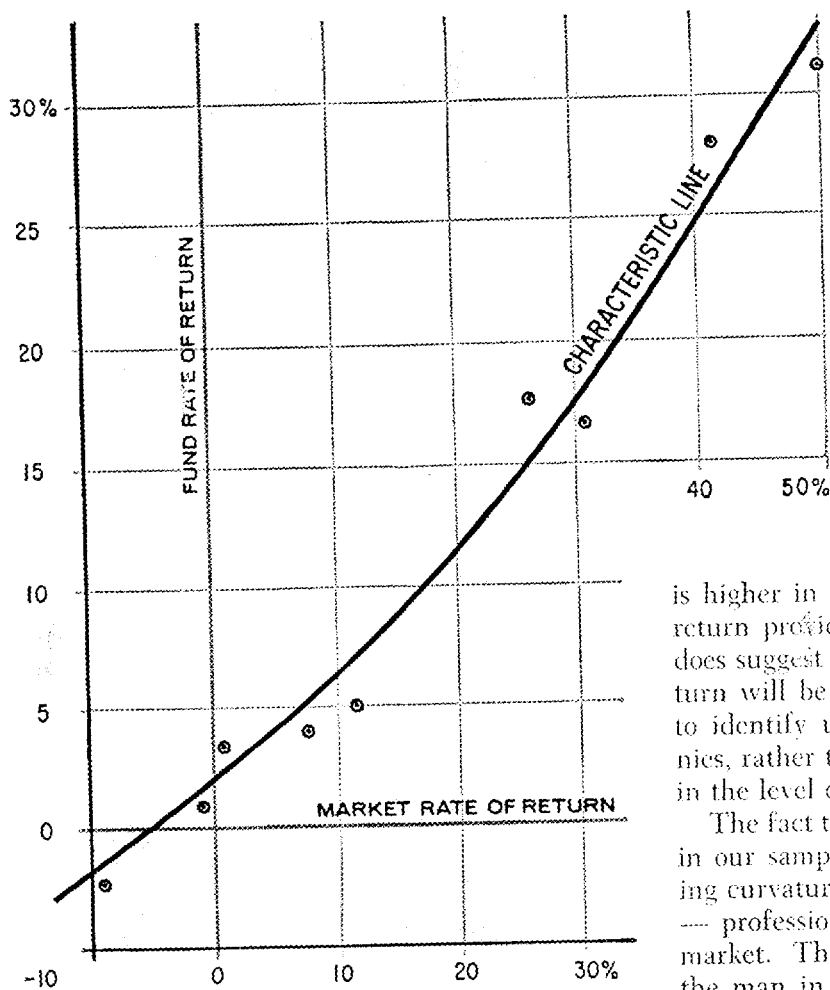
• EXHIBIT III summarizes our results. The value of the F statistic, plotted along the horizontal axis, is a measure of the degree of curvature of the fund (and is normalized to allow for variations in the amount of random scatter observed). The vertical axis shows the number of funds which had F values equal to the F value given on the horizontal

to a segment in the middle of the pattern which, because of its shortness, is indistinguishable from a straight line.

The period 1953-1962 contains one year in which the Dow-Jones Industrials demonstrated a rate of return of 50%, and three years in which the return was negative by substantial amounts. We feel that this is a suitable period for our study because it is long enough to cover a variety of ups and downs in the general market, short enough to avoid serious problems resulting from the gradual drift of fund policies over time, and recent enough to reflect modern mutual fund management practices and policies. The fact that the market was generally rising throughout the period has no effect on the characteristic line, and hence in no way invalidates our findings.

We have used yearly data because we feel that even the smaller mutual funds would be reluctant to make the changes in portfolio composition necessary to change fund volatility much more often than once a year. Based as it is on yearly data, however, the study cannot detect any success that fund managements may have had with more frequent changes in volatility.

EXHIBIT IV. CHARACTERISTIC LINE OF THE FUND WHICH HAS THE GREATEST F VALUE



axis. As the magnitude of an F value increases, the higher the probability that the amount of curvature seen for the fund is real, i.e., is greater than we would expect by random chance. The vertical dotted line marks the F value (5.6) corresponding to the amount of apparent curvature which even those funds that have no real curvature would display one time in twenty. A fund should show an F value greater than 5.6 in order to be considered to have real curvature.

In our sample of 57 managed funds, only one displayed even an F value of 5.6. This fund's curve and also the actual data points are given in EXHIBIT IV.

In other words, our findings show that for the mutual funds in our sample, at least, it is safe to assume that their characteristic lines are straight. Actual funds tend to resemble the fund in EXHIBIT I-A rather than the funds in EXHIBITS I-B and I-D. Our results suggest that an investor in mutual funds is completely dependent on fluctuations in the general market. This is not to say that a skillful fund management cannot provide the investor with a rate of return that

is higher in both bad times and good than the return provided by the market averages, but it does suggest that the improvement in rate of return will be due to the fund manager's ability to identify underpriced industries and companies, rather than to any ability to outguess turns in the level of the market as a whole.

The fact that only one of the 57 mutual funds in our sample has a characteristic line suggesting curvature indicates that perhaps no investor — professional or amateur — can outguess the market. This finding has clear significance for the man in the street managing his own portfolio, for the man with fiduciary responsibility for a private estate, for the president of a manufacturing company responsible for its pension fund, and for a college treasurer managing an endowment. It means that probably the best assumption they can make is that investment managers have no ability to outguess the market and should not try to. It also means they should not hold fund managers responsible for failing to foresee changes in market climate.

Profits on the exchange are the treasures of goblins. At one time they may be carbuncle stones, then coals, then diamonds, then flint-stones, then morning dew, then tears.

— Joseph de la Vega,  
*Confusion de Confusiones* (1688)