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Past Performance Is Just That

"Mining Fool's Gold," an article in the March/April issue of the *Financial Analysts Journal*, solved a puzzler, which is: Why do proposed investment strategies consistently fail to achieve results implied by past performance?

Perhaps as often as once a month, stock market entrepreneurs have told me about strategies that performed x percent better than averages. Presentations include detailed "back testing" and month-by-month printed records showing that a strategy did well, some theoretically achieving rates of return 25 percent to 75 percent above an apparently relevant average or index. Five to ten pages of prospectuses or supporting literature are devoted to immensely detailed records designed to prove efficacy. Such records document month-end and cumulative values over defined periods of between five and twenty years.

In the presence of such overwhelming data, both amateur and professional investors ignore the large-type caveat: "Past performance is no guarantee of future results." We ignore it because we want the future to be like the past. We, all of us, want to experience an orderly life. We want Friday to occur every seven days, as we want night to follow day. We seek to identify physical and sociological patterns, as well as apparently consistent philosophies, to bring order to life. Hence, the appearance of an orderly pattern of stock prices is irresistibly appealing. The power of one optimistic glimpse of the past blinds us to thousands of other interpretations and implications.

With the acumen of creative minds and the limitless capability to computer-message data, all sorts of patterns (strategies) emerge. Without limit, professional students of investment history can examine data to prove a hypothesis. For example, strategies comparing

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buying on Monday can be compared to buying on Tuesday. Buying on the second Monday can be compared to buying on the first Monday. Buying on the fourth Monday following a Super Bowl victory by a member of the National Football League can be compared to a strategy that buys 23 hours and 40 minutes following Indiana Pacer losses in odd-numbered years.

Each of these attempts to identify reliable patterns represents an intellectual effort described as "data mining"

According to authors Grant McQueen and Steven Thorley (Brigham Young University associate professors), "data mining is the practice of finding forecasting models by searching through databases for correlations, patterns, or trading rules. After searching through enough variables or rules—say 100—a researcher will find, simply by chance, about five that are

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statistically significant at the 95-percent confidence level.” This is to say that any observer of any data, including data about weather, population trends, health-related phenomena, or stock prices, will find patterns. Some patterns are based in physical reality. For example, seasonal changes of weather are concretely related to the relative positions of the sun and the earth. Other patterns are disconnected from observed tangible phenomena. The prices of stocks—in general, over long periods—are not related to routine events in time such as days, weeks, months and years. Stock prices might be logically related to net earnings or to other measures of real value, but logic does not support connections to calendar functions, volatility measures, moving averages, and other data derived from the price data itself. Perhaps price data imply fundamental experience, as a mirror reflects a portion of a person’s countenance. However, the mirror manifests only a brief and partial reality. The mirror has no predictive function.

In the stock market, theoretically predictive constructs based only on price information are like attempts to determine how long I will go between hair cuts by recording periodic images of

myself in mirrors. Looking back, someone might find a pattern of change. For example, a person looking at photographs of day-by-day mirror images might observe curly ends at five weeks. He then might connect this information to an observed absence of curls in images taken at four or six weeks in the past, concluding that anyone with curls gets a haircut at a predictable time.

A Mountain of Data

Data mining is a conscious effort to find patterns. The first step is to select data. Miners must know where to dig. The most compelling data sets are popular averages, such as those sponsored by Standard & Poor, Dow Jones, Russell, Bloomberg and others. At creation, these popular averages and indexes were selected to measure macro trends. For example, The Dow Jones Average of 30 Industrial Companies appropriately filled a need to measure the entire stock market. The stocks selected for inclusion in the average, at the time, clearly were the most significant business enterprises. However, with the passage of time, their relative statistical significance declined, prompting other smart people to create broader indexes, such as the S&P 500 or The Russell 2000, as well as to compute average share prices on entire exchanges. The goal of these composites is purely statistical. It is to demonstrate macro trends. The index creators had to make choices. They had to decide which jewels to mine. They did not create the indexes as sources of raw data for strategies. That came later.

At first, index data was used only to measure current value, as in “The Dow closed today at 200.” This is identical to saying, “the temperature at 4 p.m. today was 72 degrees.” A statement, not a prediction. As years passed, daily facts became history, a published set of numbers easily retrieved and observed. By the time of the computer revolution, a mountain of price data was available to

massage, manipulate, evaluate—to mine.

Digging for Meaning

Early attempts to make sense out of raw data produced the Dow Theories, which attempted to forecast the market by reviewing trends in the Industrial, Transportation, and Utility Averages. Theorists said that if a trend in one Dow average were confirmed by a trend in the others, a realistic forecast could be rendered.

Digging for meaning, however, did not stop with these conclusions, for four reasons. First, meaningful profit was not earned by these theories. Second, the theories projected the market as a whole, not individual securities. Third, the activities of thousands of investors utilizing the same theory tend to distort or even to eliminate desired results. Finally, old theories are not fodder for best-selling new books. Authors need new theories. The only solution is to mine further—to find additional patterns having greater potential utility.

Generations of Data Mining

Professors McQueen and Thorley describe phases of data mining by placing them within the metaphorical context of human generations. The first generation of data mining might be called “great-grandfather.” The term could be applied to any observed pattern in any set of numbers, including sports results. To make a point about investment phenomena, the authors apply the name “great-grandfather” to the original Dow dividend model, also called “The Dogs of the Dow.” In this strategy, investors acquire the ten stocks of the Dow 30 having the highest dividend yields. “Grandfather,” is the next generation of data mining. This is “The Dow 5” strategy, which buys the five lowest-priced stocks among the ten.

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Past Performance Is Just That. But on the Other Hand. . .

Investment systems, such as those derived from data mining, have utility because they encourage the reticent to invest. Assuming that theories extracted from deep mines do not lead to the purchase of speculative stocks or to speculative actions, such as exaggerated use of margin, selling naked calls or randomly selling short, these theories encourage individuals to assume risk and to live more comfortably with risk. While real future returns seldom arrive at the observed levels of past theoretical returns, investment results still are likely to exceed the performance of money market funds, certificates of deposit, and bonds. Often, “being in the market,” in whatever nonspeculative form, is best. If a data-mined theory compels a person to “take the plunge,” or if the theory dictates “staying the course” during tough periods, the “discoverers” deserve reward.

To Rent—or Not To Rent?

A reader called to challenge an assumption in the last newsletter that renting homes is superior to purchasing. The assumption appeared in a story asserting that financial planning should promote creation of dreams. Obviously, creation of a goal (dream) must precede implementation. Investors cannot implement that to which they do not aspire. The presence, in the future, of financial wherewithal and personal flexibility promotes creation and nurture of dreams. It is like fertilizer in the garage that can be applied anytime, at will, without great effort. Hence, the 25-year-old who plans and achieves a net worth of \$100,000 or \$200,000 by age 40, has a lot of fertilizer in her garage. If renting instead of purchasing saves money (facilitates more savings), then the young should consider renting.

However, the reader disagreed. He believes that the combination of income tax deductions for interest and real estate taxes paid, plus mortgage amortization, plus price appreciation, will produce the best result.

What do you think? (Call 317-228-0800 to leave your answer.)

I Was So Dumb. . .

The *Wall Street Journal* recently published “I-was-really-dumb” letters from readers. Here are a few quotes:

“Not once, but twice, I made the mistake of buying a new car instead of used.”

“We should have started earlier. The savings rate required when you don’t really start putting away for your retirement until your 40s is so much greater than if you had begun an earlier, modest investment program. We now have to put away 20 percent to 25 percent of our income.”

“My dumbest financial move was to take out a home-equity loan to start up a business. The business failed due to lack of planning and marketing. I am still suffering the ramifications.”

“Purchasing penny stocks is hazardous to your financial condition. I have finally learned that it is extremely unlikely that purchasing a penny stock will yield significant returns.”

“I re-balanced my portfolio at the beginning of 1998 and, in the process, incurred \$35,000 in [taxable] capital gains [that could have been avoided].”

“The Best Time To Buy . . .

. . . a straw hat is in winter.” Remember the financial chaos in Brazil. A person who acquired the average stock in Brazil is up 17.4 percent since December in dollars, 65.4 percent in local currency.

What about Russia? The numbers are 111.9 percent in dollars, 15.9 percent in local currency.

And look at Indonesia, the problem nation. The numbers are 50.6 percent and 52.3 percent .

If we had only known. . . .

These numbers are from the *New York Times*, May 23.

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“Dow Four” was developed next, and is called “father.” This strategy drops the lowest-priced stock, leaving four in the portfolio. Finally, the “son” is born. It is called “The Foolish Four.” In this strategy, the lowest-priced stock still is eliminated, but the second lowest-priced stock is given a double weighting, which is 40 percent of the portfolio, while the remaining three are 20 percent. According to a service called “The Motley Fool,” application of this strategy from 1973 to 1993 produced an average annual return of 25 percent. Whether stated or unstated, the implication is that investors following “The Foolish Four” strategy will earn 25 percent a year in the future.

With all this supporting data, why does the strategy fall short in real life? The reasons are:

- Confirming studies are not possible because researchers do not know the number of alternative patterns discovered and rejected by advocates. Statistical evaluation is not possible without this information because the intellectual process cannot be seen. Probably, the process entailed testing a hypothesis until it did not work, then making one or more changes until the numbers proved profit. Changing from five stocks to four is an example of

“tweaking” the strategy to achieve a predetermined objective of 25 percent per year—looking back. In the spirit of fun, the authors further mined the data, producing “The Fractured Four,” based on their observation that the four stocks did better in even numbered years. While the profit looking back was higher, predictive power appears ludicrous.

- With each new mining generation, the connection to reality is stretched beyond reason. For example, logic cannot justify isolating the lowest-priced stock, because the only difference between a \$20 stock and a \$10 stock is one split.
- Trading rules do not work “out of sample.” A valid theory must work in more than one circumstance. When the authors tested “The Foolish Four” strategy over periods other than the original period of 1973 to 1993, both absolute and relative results varied significantly from the results of the original model.
- Results do not include trading expenses and taxes.
- When large numbers of investors follow the same trading rule, actual prices vary from prices utilized in

back testing. If a strategy calls for purchase on the first trading day of a year, based on closing prices the previous year, real purchase prices of targeted stocks rise, and sales prices of eliminated stocks fall. Hence, the real investment result is different than the theoretical result that is based on newspaper prices.

Mining for data that might be predictive can be useful, providing that the shovels don’t dig too deep. Statisticians placed 30 stocks in The Dow Jones Industrial Average after mining for statistical and fundamental significance. A cursory review of the names of those stocks reveals companies of supreme importance to our economy. The same is true of the S&P 500 and other indexes containing larger numbers of securities. The problem arises when researchers apply more and more filters to the base data, rejecting filters that do not produce the desired result and adding filters until the rate-of-return goal of the researchers magically appears. Examples of such apparently meaningless filters are low price, doubling up on the second lowest price, buying and selling on a specific day, or taking different action in even-numbered years than in odd-numbered years. These filters lack fundamental sense. They are the result of searching too hard.



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