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# BUYING TRACK RECORD

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Investors rely on track record to select investments. There are many reasons why this should be so, but a primary factor is that, being interested in building wealth, investors focus on investment return. They generalize from recent investment history, just as they do in other areas of life, where this approach is often useful and rewarding.

Investors apply this process to investment decisions because:

- We want to believe that recent returns convey important information.
- We want to believe that this information will allow us to select good investments.
- We want to believe that selecting good investments will result in a well-designed portfolio.

The practical outcome is a focus on recent history. Investors prefer investments that have recently earned high returns. Recent returns are given more weight than long term returns, and investments with recent poor returns are shunned as risky.

Available information reinforces our natural tendency to choose investments based on recent performance. We are barraged with fund performance information from the financial press, fund advertising and promotion, and third party services such as Morningstar, Lipper and CDA. We have little other data to make financial decisions. Furthermore, other than the horse race between managers, there is no popularly understood theoretical model forming a rational framework for selecting among investment alternatives.

In relying on recent track record, the investor finds an important decision on a relatively small data set: investment performance over a limited period of time. The limited data set can bias expectations. Investors tend to believe that the current state of affairs will continue.

## How Track Record Hides Risk

A more profound difficulty arises, however, because excellent track records mask the risk inherent in the investment process. Although most investors realize that risk is related (in an approximately linear fashion) to reward, superlative track records can obscure this important fact. Consider, for example, reaction to the 31.15% yearly return on the S&P 500 index over the most recent three calendar years (January 1, 1995 through December 31, 1997). Some analysts are speaking of a New Economic Paradigm in which the U.S. economy has become immune to the business cycle (O Brave New World, that hath such creatures in't!).

Where's the risk? The risk, as this story goes, lies in not being fully invested in the U.S. market. In the last three years the investors who took all the risk were those who put money into investments other than U.S. stocks. The proof can be found in the incontrovertible evidence of recent track records. Non-stock and non-U.S. investments either lost value or underperformed the U.S. stock market over the three year period. Thus the investor may now believe that the future return on the U.S. equity market will average 17%, far higher than the historical mean of 10.7%. Perhaps it will. Still, the language of the New Paradigm investors is remarkably similar to descriptions of the go-go markets of the 1960's (remember the "Nifty-Fifty" and the new economic paradigm of the diversified conglomerate?), or the presumed eternal upward march of California real estate values in the 1970s.

The conceptual trap here lies in the tendency to assign all risk to the course of action which, in retrospect, is seen to have failed, and to excuse the course of action which has succeeded. Good track record masks risk. Looking at the record of the S&P 500 over the last few years, it is difficult to spot the risk inherent in that market. Whether or not we spot it, however, the risk is there, embedded in the investment process itself. It is unavoidable. Having advanced this argument, let's go risk hunting in the very spot where risk hides – a good track record.

## Hunting for Embedded Risk

Here's an easy hunt – a hunt for squirrels rather than for tigers. Manager A and Manager B both produce a yearly return of 20%. Do you care which one you hire to manage your money? Perhaps not, but you need more information before you can tell. Begin by decomposing the track records to see how the returns were generated. In this case, assume that each manager invested equal amounts in ten stocks with the following results:

| Stocks | Manager A | Manager B |
|--------|-----------|-----------|
| A      | +5%       | +25%      |
| B      | 0%        | -14%      |
| C      | -3%       | +37%      |
| D      | 4%        | +22%      |
| E      | -6%       | +16%      |
| F      | +2%       | -3%       |
| G      | -1%       | +42%      |
| H      | +3%       | +31%      |
| I      | -2%       | +15%      |
| J      | +198%     | +29%      |

*Investing money based solely on speculative opinion is highly uncomfortable. The statistician's tools bring out the informational content of track record in a clear and useful form. Not only do the tools answer the skill-versus-luck question, but, more importantly, they demonstrate the likely future risk and return tradeoffs.*

Intuitively, most investors would agree that they would not want Manager A to manage their nest egg. Manager A's track record reveals no ability to pick winning stocks. In fact, A saved his bacon by making what seems to be a single lucky bet. Good track record can mask investment risk.

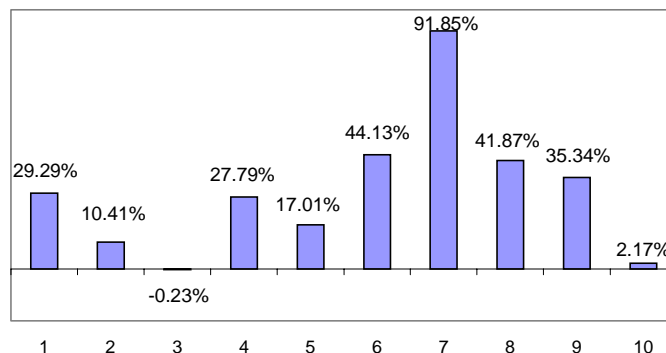
**Using Statistical Tools to Evaluate Track Record**

Significance testing is a method researchers commonly use to gauge investment risk. Simply put, the statistician measures the amount of variance in the period-to-period returns. Given this variance "benchmark," he inquires into the likelihood that the final track record is either a product of random chance or is attributable to investment skill. Analysis of the track records shows that Manager A's variance is 12.93 times higher than that of Manager B. Given this amount of variance, it is difficult for Manager A to make the claim that he is skilled rather than lucky. Mathematical analysis helps to confirm our intuitive judgement regarding which manager to hire.

Quantitative analysis can provide investors with a glimpse into the future. The analysis illuminates the probable consequences of investment decisions. Investing money based solely on speculative opinion is highly uncomfortable. The statistician's tools bring out the informational content of track record in a clear and useful form. Not only do the tools answer the skill-versus-luck question, but, more importantly, they demonstrate the likely future risk and return tradeoffs.

The variance analysis cited above is an example of an Analytical Model. We could also employ a Simulation Model. Simulation models use repeated sampling instead of computational analysis. We can use a simulation model to examine a real investment with a great "proven" track record. The simulation model shows the real (though not historically realized) risk obscured by the fabulous track record. This investment earned a 27.73% compound annual return over a ten-year period, with one annual return in excess of 91%! Year-by-year results are detailed in the graph, above.

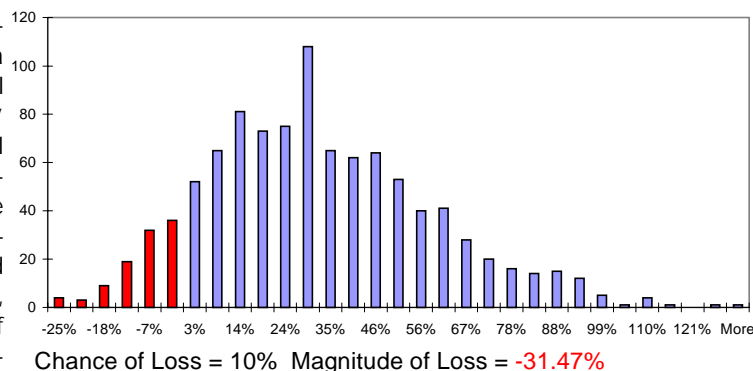
**Compound Annual Return: 27.73%**



**Illumination Through Simulation**

A long-term track record of over 25% per year is excellent by any standard. Even better, in this case it was achieved with little apparent risk. In its only negative year (year 3), the investment was down just 0.23%. To illustrate embedded risk, we decompose the track record month-by-month over the ten-year period. We're not interested in what happened (we already know this), but what might have happened. We randomly assemble ten-year return patterns by shuffling the pool of 120 actually experienced monthly returns. This simulation approach enables us to determine the range of possible returns with considerable confidence. The chart, below, summarizes the results of a simulation composed of 10,000 iterations of this shuffling of month to month returns over the ten year period. Even though the sampling comes from a particularly happy time in this investment's life, the downside risk revealed by the distribution is considerable. Simulated results indicate a worst case annual return of -31.47%.

**Range of Possible Results from Simulation Model**



*Virtually every independent study concludes that, over the long run, well-diversified portfolios have a better chance of earning a higher level of real wealth. Diversification increases risk-adjusted return, enhancing long-term wealth. This is why people diversify.*

*Variance from average returns – i.e., portfolio volatility – subtracts from ending wealth. The dollars earned from an investment program decrease if variance increases. Nobody escapes the mathematics of compounding.*

**Collapse of the Last “New Paradigm”**

This investment is an index of Japanese large company stocks, adjusted for U.S. currency, over the period 1980 through 1989. At the time, many observers hailed (or bewailed) a new era in world economics. The Japanese economy was destined to supercede the U.S. as the primary engine of global wealth creation. The “Japanese Model” of industrial organization was studied and imitated throughout Asia, and many argued that the U.S. should adopt a Japanese-style industrial policy. However, even during a period of wonderful returns, risk is present, not just as an abstract concept, but as a real possibility that may become manifest at any moment. The index of Japanese large company stocks declined 39% in 1990, and has endured difficult times ever since.

This does not mean that an inevitable doom necessarily lurks just around the corner for U.S. markets. It does mean there is no escaping risk. Risk is embedded in the investment process whether or not it is apparent in any given period. Even after you flip a coin heads ten times in a row, your chance of heads on the next toss is 50/50.

**Reducing Variance Enhances Returns**

A manager’s historical success is meaningful to a prospective investor only to the extent that it can reasonably be expected to continue. However, even those investors who know that chasing managers with superior track records leads to disappointment still join in the chase. It’s human nature – people like to pick winners. But portfolios of good investments are usually lousy portfolios.

If we define good investments as those with excellent recent track records, it stands to reason that good investments will have flourished under recent economic conditions. When economic conditions change (inflation, international trade balances, exchange rates, unemployment, growth in GDP, and so forth) recent winners may come to grief. Indeed, if we build a portfolio of investments that flourish under the same narrow set of economic conditions, we have unwittingly created substantial risk by concentrating our bets on a small set of economic factors. Such portfolios of (recently) good investments increase the expected variance of investment returns. Consider the following simple example:

| Year | Investment P | Investment Q |
|------|--------------|--------------|
| 1    | -20%         | +1%          |
| 2    | +25%         | +1%          |
| 3    | -20%         | +1%          |
| 4    | +25%         | +1%          |

Investment P averaged 2.5% per year while Q averaged 1%. Nevertheless, for every dollar invested in P, at the end of four years you ended up where you started - with \$1.00. Meanwhile you earned \$1.05 for every dollar invested in Q. Why? P experienced considerable variance, while Q had none. Loading up on high variance investments with good recent track records may be hazardous to your wealth! The real issue, therefore, is not which investment made the highest return, but rather which investment earned the most return per unit of risk undertaken. Academics call this measure “risk-adjusted return.”

Virtually every independent study concludes that, over the long run, well-diversified portfolios have a better chance of earning a higher level of real wealth. Diversification increases risk-adjusted return, enhancing long-term wealth. This is why people diversify.

Say that you put all your eggs in one basket (one stock, one mutual fund, etc.). During the subsequent year, a well-diversified portfolio earns 10% and your one egg basket earns 20%. Did you get a free 10%? No – you concentrated your bet (“put it all on red”). You should have earned more because you took more risk. If you don’t believe this, go to Reno and look at the huge payoffs that the lucky winners receive when they concentrate their bets! Decide for yourself if this is a prudent way to accumulate wealth.

$$\text{Compound Wealth} = \text{Average Return} - \frac{1}{2}(\text{Variance})$$

Variance from average returns – i.e., portfolio volatility – subtracts from ending wealth. The dollars earned from an investment program decrease if variance increases. Nobody escapes the mathematics of compounding.

**Choosing Investments Based on Track Record**

Here’s another real-world example. Let’s assume that you want a portfolio to provide wealth-accumulation over forty years. Which

investment would you choose to buy today, given only the recent track records:

| Year                       | Series A      | Series B       |
|----------------------------|---------------|----------------|
| 1991                       | 51.61%        | 7.11%          |
| 1992                       | 26.03%        | <b>-26.10%</b> |
| 1993                       | 19.86%        | 14.16%         |
| 1994                       | <b>-2.30%</b> | 29.49%         |
| 1995                       | 32.62%        | <b>-3.57%</b>  |
| 1996                       | 18.86%        | <b>-22.79%</b> |
| Annualized Compound Return | 23.38%        | <b>-2.27%</b>  |
| Risk                       | 17.75%        | 21.60%         |
| Growth of \$10,000         | \$30,530      | \$8,700        |

If we increased your data set to include the long term track record from 1973, which investment would you select?

| Year                       | Series A       | Series B       |
|----------------------------|----------------|----------------|
| 1973                       | <b>-38.96%</b> | 0.38%          |
| 1974                       | <b>-28.65%</b> | <b>-2.23%</b>  |
| 1975                       | 65.71%         | 15.92%         |
| 1976                       | 51.05%         | 38.11%         |
| 1977                       | 26.80%         | 34.00%         |
| 1978                       | 25.80%         | 95.71%         |
| 1979                       | 43.19%         | <b>-20.63%</b> |
| 1980                       | 41.86%         | 35.17%         |
| 1981                       | <b>-2.69%</b>  | <b>-8.52%</b>  |
| 1982                       | 24.26%         | <b>-5.05%</b>  |
| 1983                       | 33.78%         | 41.75%         |
| 1984                       | <b>-11.58%</b> | 13.22%         |
| 1985                       | 26.16%         | 62.83%         |
| 1986                       | 3.45%          | 60.35%         |
| 1987                       | <b>-14.16%</b> | 87.58%         |
| 1988                       | 19.92%         | 32.45%         |
| 1989                       | 8.22%          | 38.51%         |
| 1990                       | <b>-28.03%</b> | <b>-33.36%</b> |
| 1991                       | 51.61%         | 7.11%          |
| 1992                       | 26.03%         | <b>-26.10%</b> |
| 1993                       | 19.86%         | 14.16%         |
| 1994                       | <b>-2.30%</b>  | 29.49%         |
| 1995                       | 32.62%         | <b>-3.57%</b>  |
| 1996                       | 18.86%         | <b>-22.79%</b> |
| Annualized Compound Return | 12.96%         | 15.56%         |
| Risk                       | 27.20%         | 34.37%         |
| Growth of \$10,000         | \$186,400      | \$321,400      |

**The Diversification Benefit**

Track record analysis becomes meaningful only when we consider the two return series together. When these particular series are combined (see the table on the following page), we see that returns from the two series tend to offset each other.

A combination of equal parts Series A (Ibbotson's index of U.S. small stocks) and Series B (Nomura's index of Japanese small stocks) produces much less return variance than either investment alone. And with lower variance, we experience a significant increase in ending wealth. Diversification works. In the words of Nobel Prize winner Merton Miller: "Diversification is your buddy."

| Year                       | Series A       | Series B       | 50% Series A / 50% Series B |
|----------------------------|----------------|----------------|-----------------------------|
| 1973                       | <b>-38.96%</b> | 0.38%          | <b>-19.29%</b>              |
| 1974                       | <b>-28.65%</b> | <b>-2.23%</b>  | <b>-15.44%</b>              |
| 1975                       | 65.71%         | 15.92%         | 40.81%                      |
| 1976                       | 51.05%         | 38.11%         | 44.58%                      |
| 1977                       | 26.80%         | 34.00%         | 30.40%                      |
| 1978                       | 25.80%         | 95.71%         | 60.75%                      |
| 1979                       | 43.19%         | <b>-20.63%</b> | 11.28%                      |
| 1980                       | 41.86%         | 35.17%         | 38.51%                      |
| 1981                       | <b>-2.69%</b>  | <b>-8.52%</b>  | <b>-5.60%</b>               |
| 1982                       | 24.26%         | <b>-5.05%</b>  | 9.60%                       |
| 1983                       | 33.78%         | 41.75%         | 37.77%                      |
| 1984                       | <b>-11.58%</b> | 13.22%         | 0.82%                       |
| 1985                       | 26.16%         | 62.83%         | 44.49%                      |
| 1986                       | 3.45%          | 60.35%         | 31.90%                      |
| 1987                       | <b>-14.16%</b> | 87.58%         | 36.71%                      |
| 1988                       | 19.92%         | 32.45%         | 26.19%                      |
| 1989                       | 8.22%          | 38.51%         | 23.37%                      |
| 1990                       | <b>-28.03%</b> | <b>-33.36%</b> | <b>-30.70%</b>              |
| 1991                       | 51.61%         | 7.11%          | 29.36%                      |
| 1992                       | 26.03%         | <b>-26.10%</b> | <b>-0.04%</b>               |
| 1993                       | 19.86%         | 14.16%         | 17.01%                      |
| 1994                       | <b>-2.30%</b>  | 29.49%         | 13.59%                      |
| 1995                       | 32.62%         | <b>-3.57%</b>  | 14.53%                      |
| 1996                       | 18.86%         | <b>-22.79%</b> | <b>-1.96%</b>               |
| <b>Negative Years</b>      | <b>7</b>       | <b>8</b>       | <b>6</b>                    |
| Annualized Compound Return | 12.96%         | 15.56%         | 15.97%                      |
| Risk                       | 27.20%         | 34.37%         | 22.93%                      |
| Growth of \$10,000         | \$186,400      | \$321,400      | \$349,900                   |

*Diversification works. In the words of Nobel Prize winner Merton Miller: "Diversification is your buddy."*

*Unfortunately, market timing's risk reduction benefits are predicated on an ability to make successful market timing calls. The risk of being 1/3 in stocks, 1/3 in bonds, and 1/3 in cash over a period of time is very different from the risk of being 100% in stocks for 1/3 of the time, 100% in bonds for 1/3 of the time, and 100% in cash for 1/3 of the time. The former strategy controls risk; the latter strategy sends it through the roof.*

### **Reducing Risk by Timing the Market**

We just demonstrated that ending wealth is a function of risk-adjusted return. If only we could know when stocks were about to crash. We could quickly move out of the market and into safer investments, such as bonds or cash. Wouldn't this be a safer way to invest?

Unfortunately, market timing's risk reduction benefits are predicated on an ability to make successful market timing calls. The risk of being 1/3 in stocks, 1/3 in bonds, and 1/3 in cash over a period of time is very different from the risk of being 100% in stocks for 1/3 of the time, 100% in bonds for 1/3 of the time, and 100% in cash for 1/3 of the time. The former strategy controls risk; the latter strategy sends it through the roof. When we measure value added in terms of risk-adjusted performance, it becomes very difficult for the market timer to justify his activities. One wrong call can wipe out a lot of accumulated dollars. But what if we could find the successful market timers? We ought to be able to locate them by reviewing their track records.....

### **Avoiding the Sucker's Bet**

Track record is useful only when combined with statistical analysis (using simulation or analytical models) that illuminate the embedded risks underlying the pattern of returns. Such analysis mines the history of an investment to reveal the buried information it carries about possible future results. A naive reliance on recent track record leads to obvious but erroneous conclusions. Using track records, the investor may chase the latest set of hot hands, or flee the latest crashing asset class, to the long-term detriment of the portfolio. To avoid this kind of sucker's bet, investors should rely on the stabilizing influence of long-term investment policy. As Charles Ellis so eloquently summarized in his definitive volume, Investment Policy:

*History teaches that both investment managers and clients need help if they are to hold successfully to the discipline of long-term commitments. This means restraining themselves from reacting inappropriately to disconcerting short-term data and keeping themselves from taking those unwise actions that seem so "obvious" and urgent to optimists at market highs and to pessimists*

*at market lows. The best shield against the outrageous attacks of acute short-term data and distress are knowledge and understanding committed to writing.*

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