

Efficient frontier: Is it market timing in disguise?

By **Jim Otar**

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Efficient-frontier theory is one of the pillars of current investment practice.

First defined in 1952 by Harry Markowitz, it shifted the focus from individual securities to the entire portfolio. Nowadays, it is used for everything from selling mutual funds to determining the "right" asset mix.

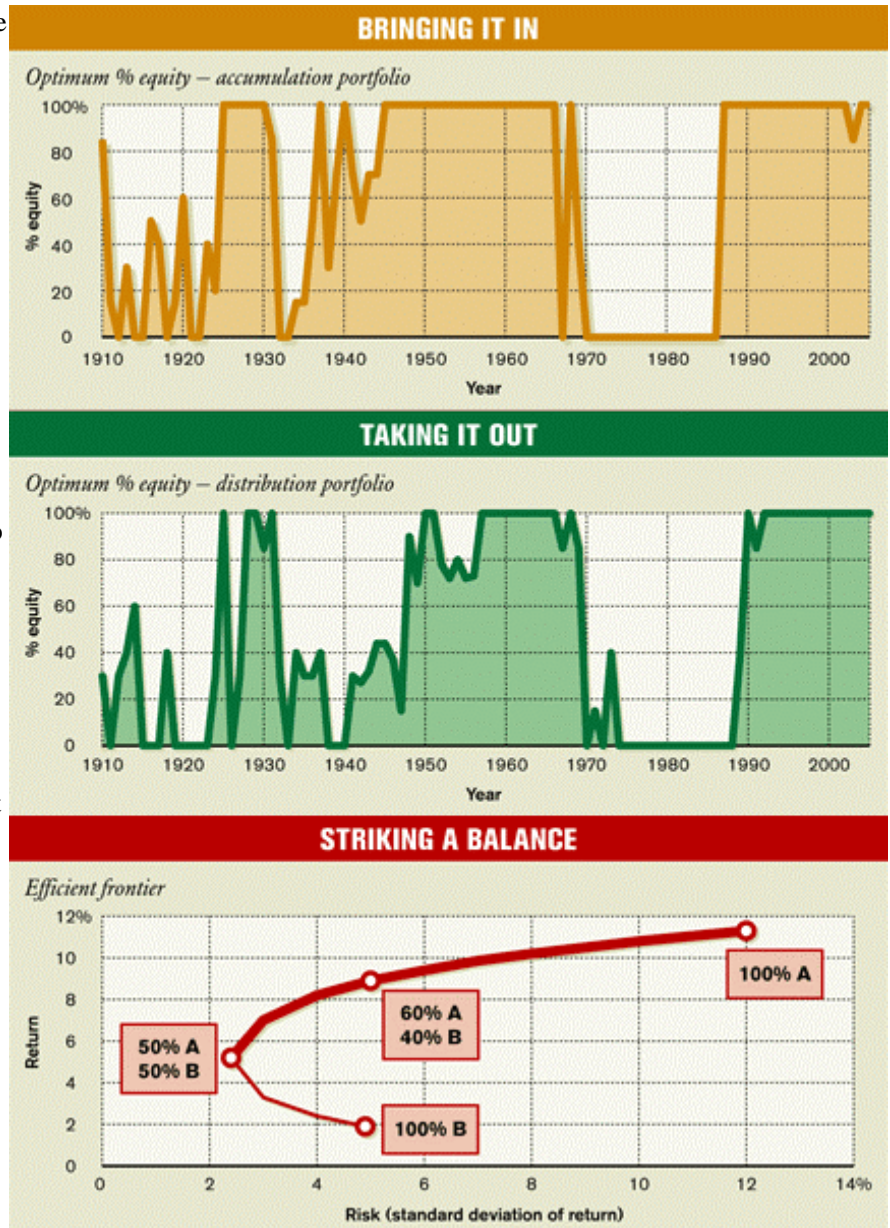
To refresh your memory on the efficient-frontier concept: The returns and the risk (defined as the standard deviation of returns) of two securities are plotted on a chart. The vertical axis indicates returns, and the horizontal axis represents the standard deviation.

The returns and the risk of the portfolio comprising these two securities, let's call them A and B, at different proportions are plotted on the same chart, as shown in the example (above right). These points then are connected.

The top, thicker part of the line is called the efficient frontier.

Looking at this chart, we can make the following conclusions:

- Investing all of the money in B gives the lowest return. Instead, you can invest 60% in A and 40% in B, and get significantly higher return for the same level of risk.
- Investing 50% each in A and B gives the highest return at the lowest risk.
- Investing all of the money in A gives a higher return than investing 60% in A and 40% in B but at a significantly higher risk.



After observing this chart, an unsuspecting investor might conclude, "This is wonderful; let's invest 60% of the money in A and 40% in B." Actually, this is the generally accepted standard practice in our business.

What are the flaws? The first one is the time frame.

Efficient-frontier charts are based on historical performance. Many use a three-year or a five-year history.

Such a short time period mismatches the length of the two most prominent market cycles. The secular trends - aka megatrends - are the long-term trends that can last up to 20 years.

Even if you use a 20-year history for your efficient frontier, it reflects only events during that particular secular trend, ones that may never be repeated in your lifetime. The cyclical trends usually last four to six years.

If you use a five-year history, you may be applying the events of one cyclical trend to your efficient-frontier analysis, which is usually irrelevant for the subsequent cycle.

The second flaw of the efficient frontier is that it inherently assumes that the risk-and-return profile of investments will remain essentially the same in the future as it was in the past. This usually is not the case.

Let's look at an example: We have one accumulation and one distribution portfolio.

In the accumulation portfolio, the investor saves \$10,000 each year. In the distribution portfolio, the investor starts with \$1 million and takes out \$50,000 each year, indexed to inflation.

Our objective is to find the "right" asset mix using the efficient frontier to establish an optimum mix of stocks and bonds.

Now we go to the next step: Let's say that it is 1910.

We look back at market history for the preceding 10 years. We then optimize the asset mix using annual returns and the volatility of each asset class.

Next, we move on to 1911 and optimize the asset mix using the preceding 10 years of data, and so on. When we do this calculation for all the years until the end of last year, a very interesting picture emerges.

It is interesting to note that it took the efficient frontier four years to recognize the devastating 1929 crash and go from 100% to 0% equity. Ironically, that happened just prior to the biggest cyclical bull market of the last century (1933-36).

In effect, the outcome looks very much like a market-timing model. The equity percentage swings from 0% to 100% in short periods of time.

This can't be described in any way other than as a complicated market-timing model. And it is a very bad one, I might add.

Instead of a 10-year history, I tried the same charts with a 20-year history. That smoothed some of the jagged edges, but the general picture remained the same.

What do we learn from this observation? Here are my rules for the efficient-frontier analysis:

- 1) Don't use its analysis for optimizing the asset class mix.
- 2) You can ignore Rule 1 only if your historical data cover at least two secular trends, i.e., a minimum of 40 years of look-back.
- 3) Don't use the efficient-frontier analysis for the purpose of market/sector/country timing by applying a shorter history. Analysis based on three or five years is useless for this purpose. Much better timing tools are available in the realm of technical and intermarket analysis.
- 4) If you are comparing different mutual funds, it is OK to use the efficient-frontier analysis. The performance history must cover at least 10 years of the same fund manager.
- 5) It is OK to use the efficient-frontier analysis for investments in a single asset class, usually individual stocks, using a shorter history.

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