# *The Alchemy of Enterprise Risk Management: Examples from the Investment World*

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Please permit me a personal preamble. This is my thirteenth, and last, quarterly commentary on Enterprise Risk Management for IRMI. With my change in career earlier this year, from risk management to wealth management, I believe it is time to turn this forum over to someone with the time and the fresh perspective to take it to the next level. I have attempted, in this final piece, to share some interesting (I trust) ERM observations that happen to represent a bridge between my old and new disciplines.

**ERM and the "Portfolio Effect"**

In prior articles in this series, it has been noted that one of the features of the world that allows ERM to create value is the fact that bad things tend not to occur in concert. The potentially devastating effects to the enterprise of such events as earthquakes, windstorms, power outages, financial market upheavals, strategic missteps, competitive threats, supply chain disruptions, management malfeasance, reputational attacks, etc., etc., tend not to all hit the books in the same fiscal quarter. That is to say, these events are not "perfectly correlated". In some cases, their effects may even be negatively correlated. The income statement may be hurt by lower interest rates, but the balance sheet gets stronger. Raw materials may become more expensive with a falling dollar, but sales improve due to growing export business.

The point of ERM is for the enterprise to view its risks holistically and, by doing so, let the independence among most of its risks, and the "natural hedging" among some of their effects, play out. Managing risks one at a time, in "silo" fashion, is suboptimal and, to the extent component risk managers step in between the natural hedges with risk controls specific to their silos, it can actually be detrimental.

ERM aficionados, in making this point, cite the parallels to Modern Portfolio Theory (MPT). MPT documents – and provides the analytical structure behind – the benefits of diversification among risky assets that are not perfectly correlated. (MPT has made such an impact on professional standards in the investment world that the "Prudent Man Rule", which emphasized managing the risk of individual investments, has been supplanted by the "Prudent Investor Rule", which holds money managers to the standard of proper diversification. The Prudent Investor Rule makes irrelevant the riskiness of individual investments – the only riskiness that matters is that of the entire portfolio.)

ERM's connection to portfolio theory is more than merely conversational. The science and practice of ERM is rooted in MPT. See, for example, the Tillinghast – Towers Perrin monograph, *RiskValueInsights: Creating Value Through Enterprise Risk Management*, as well as earlier ERM articles in this IRMI series. The essence of ERM is very much the exploitation of the "portfolio effect" described by MPT.

It is informative (or at least interesting), then, to explore MPT further to see how it achieves its alchemy. Let us do so by stepping into the domain of the investment manager.

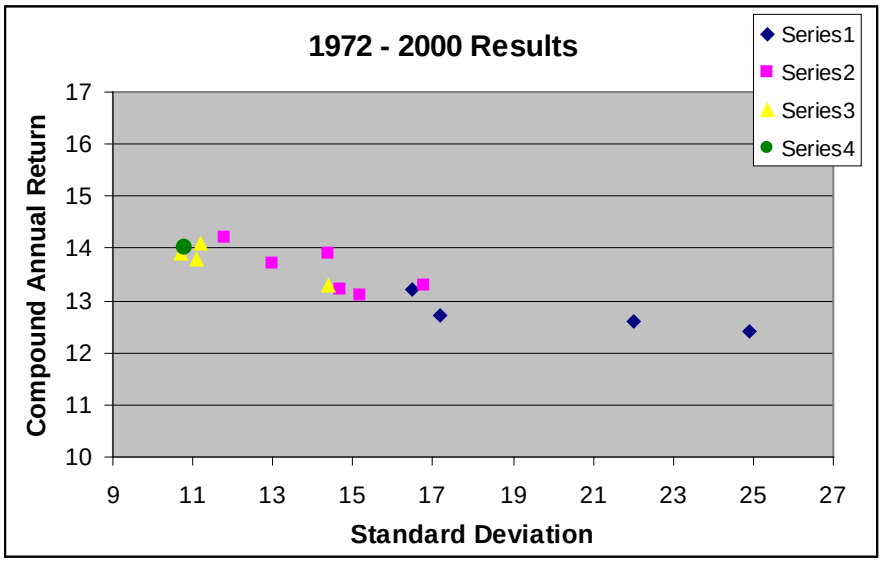
In the examples that follow, use is made of MPT's "risk/return graph" convention. In this graph, return is represented on the vertical axis, and risk (measured here by standard deviation) is represented on the horizontal axis. The objective is to construct a portfolio that is "efficient", that is, one that has minimal risk for a given level of return, or maximal return for a given level of risk. The collective of all such efficient portfolios, which form the northwestern-most envelope of all possible portfolios, is called the "efficient frontier".

***Example #1***

Of all the demonstrations I have seen over the years on the portfolio effect, this is one of the most dramatic. Its proximate source is Russell Hill, CEO, Halbert Hargrove. I have produced similar results through simulation analysis.

Consider the plot below of several different assets (*Figure 1*). Clearly, Series 2 assets are generally preferred to Series 1; Series 3 assets are generally preferred to Series 2; and the Series 4 asset is preferred to all other Series.

***Figure 1:***




What are these assets?

- Series 1 (left to right):
  - Large cap domestic equities (S&P 500)
  - Real estate (NAREIT)
  - Foreign equities (MSCI EAFE)
  - Commodities (GSCI)
- Series 2: all combinations of 2-asset portfolios constructed from Series 1
- Series 3: all combinations of 3-asset portfolios constructed from Series 1
- Series 4: the 4-asset portfolio

Periodic rebalancing is done over time to maintain a consistent mix.

Here is the remarkable part: Even when the worst-performing (southeastern-most) asset is added to the mix, the resulting portfolio is generally superior to the portfolio it was added to. In other words, **adding a low-return/high-risk asset to a portfolio can *increase* the return and *decrease* the risk of the portfolio**.

How can this be? Well, these asset classes are not very correlated with each other. This largely explains the decrease in risk. The increase in return is due to something more subtle. By disciplined rebalancing, you exploit the high volatility in the riskier assets by systematically buying in when they're low and selling out when they're high. This has been called "volatility pumping" – and rebalancing is the key.

The power of rebalancing is the focus of the second example.

**Example #2**

In most portfolio construction exercises, the task is to allocate assets among investment opportunities that are already on or near the efficient frontier, that is, among asset choices that provide increased return only via increased risk. Assets need to be allocated in such a way as to best reflect the risk/return objectives of the investor.

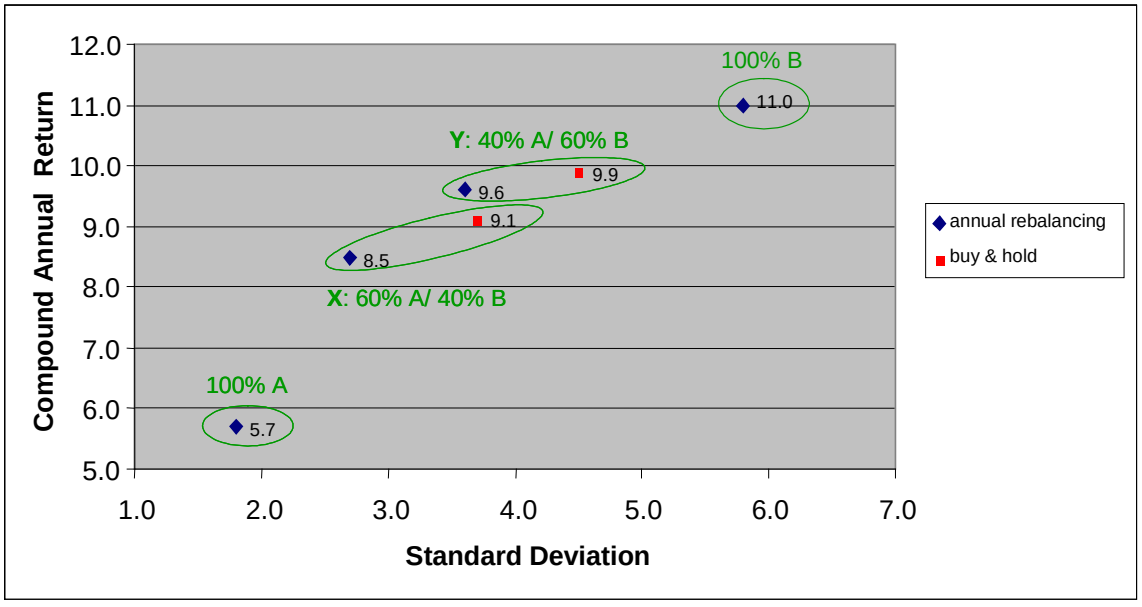
Consider two reasonably efficient asset classes. Class A has an expected annual return of 6% and an annual standard deviation of 8%; Class B, an expected return of 14% and a standard deviation of 25%. The correlation coefficient between the two classes is +15%. The risk/return profiles of A and B are not unlike the profiles of (i) an amalgam of U.S. corporate and government bonds, and (ii) an amalgam of U.S. large cap and small cap equities, respectively, over the last 70 years.

Let us suppose that investor X is moderately risk adverse, and prefers an asset allocation of 60% to Class A, 40% to Class B. Let us also suppose that his investment horizon is 20 years. If the 60/40 asset allocation is done initially, and investor X adopts a "buy-and-hold" strategy (that is, never rebalances), then simulation analysis will show that the compound annual growth rate (CAGR) of the portfolio is 9.1% and the annual standard deviation (SD) is 3.7%. Alternatively, another investor, Y, might prefer a riskier portfolio, 40% Class A/60% Class B, which, over a 20-year buy-and-hold period, produces a portfolio CAGR of 9.9% and SD of 4.5%. If, instead of buy-and-hold, these investors were to annually rebalance to their respective initial allocations, the results would compare as follows:

| | **Buy-and-Hold** | **Annually Rebalance** |
|---|---|---|
| **Investor X (60A/40B)** | | |
| CAGR | 9.1% | 8.5% |
| SD | 3.7% | 2.7% |
| **Investor Y (40A/60B)** | | |
| CAGR | 9.9% | 9.6% |
| SD | 4.5% | 3.6% |

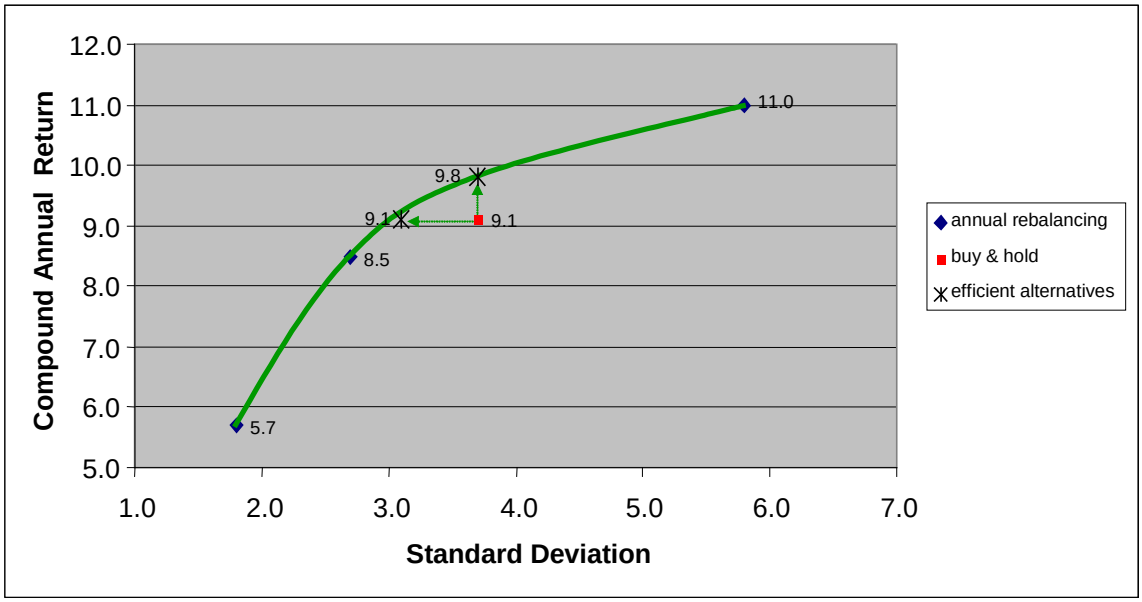
It would appear, at first glance, that the rebalancing strategy is not clearly superior to its respective buy-and-hold strategy – in each case, return is sacrificed to reduce risk. However, viewing the results in risk/reward graph format (*Figure 2*) illustrates one notable fact: the rebalancing strategy lies on (or close to) the efficient frontier, the buy-and-hold strategy clearly does not.

***Figure 2:***




What does this mean in practical terms? Let's focus on investor X with the 60/40 mix. If investor X wanted to achieve a 9.1% growth rate, he could do so much more efficiently than via his buy-and-hold strategy by instead adopting an initial 50/50 allocation with annual rebalancing. This would allow him to achieve his 9.1% return with a standard deviation of only 3.1% instead of 3.7%. Alternatively, if investor X was satisfied with his risk level of SD = 3.7%, he could get a return of 9.8% instead of 9.1% by simply adopting an initial 37/63 allocation and annually rebalancing to it. (*Figure 3*)

***Figure 3:***




Recapping this extraordinary result: In this example, **systematic rebalancing created an additional return of 70 basis points with no increase in risk**. This is a bit like creating gold from base metals, is it not?

Why isn't 37/63 with rebalancing a riskier strategy than a buy-and-hold 60/40? Doesn't 37/63 call for a much higher allocation to the riskier asset Class B? The answer is that, by not rebalancing, the buy-and-hold allocation drifts from the initial 60/40 mix to a much riskier 26/74 by the end of the 20-year investment period, by virtue of the differential growth rates in asset classes A and B. By starting at 37/63 and sticking to it, you get the same level of risk, but a materially higher return.

Now most investors, however lazy, will not let their allocations go unattended for 20 years. But the general result above holds if the scale is changed from years to quarters, or months (the magnitudes are different, not the direction).

Also, we have implicitly assumed that the cost of rebalancing is immaterial. In practice, there are transaction costs associated with rebalancing, and there may also be tax costs (but maybe not, even if the portfolio is not in a tax-advantaged account such as a 401(k) or IRA). However, in the 20-year example above, transaction costs would have to reach 15% of the reallocated amounts before the benefits of rebalancing are fully consumed, leaving much maneuvering room.

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I hope you found these examples enlightening, and this ERM series informative. I wish you much success with your ERM efforts, creating gold for your enterprise. *Jerry Miccolis*