

# Myrmikan Research

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## Heads or Tails You Lose

Jean le Rond d'Alembert was an 18th century French mathematician who devised a diabolically cunning gambling strategy. He would bet a livre on an even outcome, such as a coin-toss. If he lost, he would double his bet. Winning would return the lost livre plus gain him one. Or, if he lost again, down three livre, he would double the bet to four, and so on. For each series of bets, the result was a near certain gain of one livre.

Alembert's only risk was that his fortune would be wiped out before winning to recoup his losses. If his fortune were a million livre, he would need to lose 20 times in a row to go bust, and the chances of that happening are less than one in a million. He could play the game 44 times a day and have an even chance that he would never lose during his adult life.

But, loss would be catastrophic. Not only would Alembert forfeit his entire fortune, but also the "income" of 16,000 livre per year (a 16% yield). Using the word income here is disingenuous, of course, since these gains stem from temporary success in a zero-sum game not the yield from productive capital.

Alembert's strategy employs what is called martingale risk: small, expected gains balanced by large, rare losses. Wall Street pretends that its remuneration is the fruit of efficient allocation of capital, but, in reality, its obscene fortunes are payoffs from martingale risk-taking with other people's money. An examination of the Capital Asset Pricing Model reveals how Wall Street preys on unsuspecting investors.

The CAPM has been the cornerstone of asset portfolio theory for fifty years. Its core assumption is that, given the same level of expected return, investors will prefer the less volatile asset. For example, if a Treasury bill were yielding 5% and the expected return on a highly volatile asset were also 5%, investors would choose the Treasury. The price of the volatile asset should fall until its return had risen enough to compensate for the extra volatility.

The CAPM also assumes a perfect "market portfolio," usually approximated by the S&P 500. The volatility, or beta, of this portfolio is defined to be 1. The beta of a risk-free asset such as a Treasury bond is zero. An asset that moves with the market at twice the volatility has a beta of 2, and so on.

The CAPM is a statistical measure, so it implies there is no difference between a levered market portfolio and a collection of high-beta stocks. For this reason, asset

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managers who achieve high returns with high volatility, i.e., high beta, will not attract capital: they add no additional value because it is nearly costless to buy the S&P 500 on margin and mimic their returns.

Imagine, however, an asset manager who can return 6% with no volatility when Treasuries are yielding 5%. Such excess return is called alpha, and it would have no beta at all. Managers who can generate alpha are in high demand and can charge large fees because their gains are uncorrelated with the market and are perceived to be completely safe.

Wall Street did imagine the character described above, in fact. His name was Bernie Madoff. Unlike Charles Ponzi, Madoff never purported to produce high returns but something better: unusually consistent returns, high alpha with low beta. A generation of financiers trained in CAPM allocated Madoff billions.

The easiest way to produce alpha and attract capital, other than through fraudulent returns, is by placing frequent martingale bets. John Meriwether, a pioneer of fixed income arbitrage, best personifies this strategy. In 1994, he launched Long Term Capital Management with Myron Scholes as a partner. Scholes, who won the Noble Prize in Economics for helping to develop the Black-Scholes model of valuing options, described the firm's strategy as a giant vacuum cleaner sucking up nickels from all around the world. Alembert would have approved.

LTCM's returns for the first four years were steady and high, and investors scrambled to join. Lots of alpha. But, levered up 26 to 1, LTCM could not withstand the market turmoil caused by the Russian default in 1998. Its losses were so huge the Federal Reserve had to organize a rescue to save the financial system.

Another poster-boy for martingale risk-taking is statistician Victor Niederhoffer. Yielding spectacular returns of 35% per year from 1982 through 1996, Niederhoffer explained his method: "I figure I have traded about 2 million contracts, with an average profit of \$70 per contract." A year later, a bad bet cost Niederhoffer his firm and personal fortune. Both Meriwether and Niederhoffer launched new funds after the turmoil of the late 1990s. Both produced high returns until they blew up again in 2007.

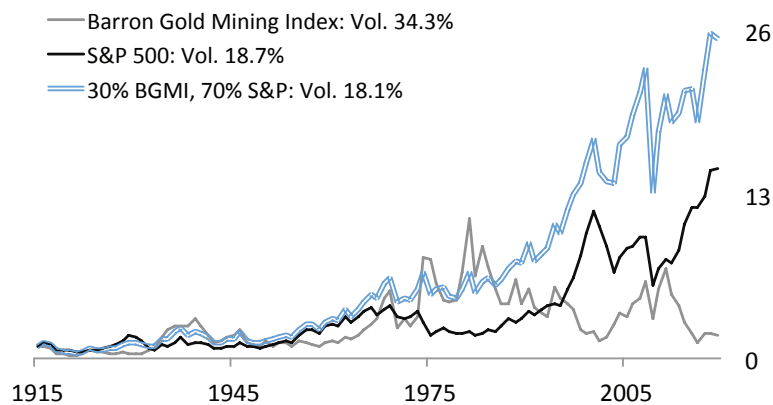
Rogue fund managers are not the only characters to exploit Wall Street's obsession with alpha. In *The Big Short*, Michael Lewis relates how AIG made steady cash—high alpha—selling insurance against a general decline of the housing market, a seemingly impossible event that had not occurred since the Great Depression. AIG was destroying value by enabling the misallocation of capital into the sub-prime housing market; nevertheless, management was paid huge bonuses because their gains were steady and uncorrelated. When the hidden risks were revealed by the market crash, the government took the losses, and the managers escaped without having to disgorge their accumulated winnings—the ultimate heads-I-win-tails-you-lose strategy.

The more interesting part of Lewis's story concerns the brave fund managers who bet on the demise of housing. In 2005, Mike Burry began buying the insurance AIG was selling, i.e., taking anti-martingale risk: Burry was likely to lose a little bit of money each month as he paid the premium but had a small chance of massive gains. Needless to say, because his analysis of the subprime market was correct, the likelihood of massive gains was actually quite high. But, until housing crashed, his investors were

furious because he was producing negative alpha, the opposite of what a fund manager is supposed to do. Luckily for them, they couldn't withdraw their money because of contractually agreed lockup periods, though some did threaten to sue.

Gold mining investors are currently playing the part of Burry. Gold mining companies tend to have sub-standard management with atrocious capital allocation discipline, for reasons discussed in previous letters. Since 1915, the Barrons Gold Mining Index has underperformed the S&P 500 by 88%.

Yet the assets gold miners hold become suddenly, incredibly valuable at the nadirs of credit cycles, making an annually rebalanced portfolio comprised of 30% BGMI and 70% S&P 500 outperform the S&P 500 alone by 68% since 1915 and with reduced volatility.



The BGMI is comprised of the large-capitalized gold miners. The junior gold mining companies are in some ways worse than these because they have all the same problems as well as a more difficult time accessing capital at decent terms. Their share prices currently reflect these challenges, which make them much more sensitive to the price of gold and, therefore, behave as better insurance.

The behavior of the juniors reveals another flaw in the CAPM. Theoretically, it would be possible to mimic the expected performance of the junior sector by levering up an ETF of senior gold mining stocks, like the GDX. But, the GDX's peak-to-trough loss was 81% and anyone levered on that trade would have received a margin call ejecting them from the position. The high-beta gold stocks, by contrast, were able to go into hibernation mode and recovered as soon as the gold price did, and much more so than did the GDX.

Myrmikan remains agnostic whether the first move for gold in a full fledged credit panic will be up or down, but remains confident that the latter case, if it happens, would be sharp, swift, and followed by an acceleration to the upside. With yields rising, Argentina and Turkey collapsing, China debt markets under pressure, Italian banks teetering, U.S. tech stocks finally faltering, the event against which Myrmikan insures may finally be close at hand.

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