

Artemis Capital Management LP

Dennis Rodman and the Art of Portfolio Optimization



Prudent diversification has long been part of the dogma of Modern Portfolio Theory (“MPT”). The failure of diversification to protect investors during the financial crash of 2008, followed by the historic reflation of financial assets at the hands of central banks (with little regard to fundamentals), has challenged the legitimacy of textbook MPT. Many institutions claim to understand the benefits of anti-correlation, but any empirical knowledge gained during the Great Recession has been long forgotten, chasing yield into the depths of low quality assets, illiquidity, and by leveraging fixed income at the zero bound. A longer study of financial history across civilizations shows that this approach will likely end in tears.

If you really want to understand portfolio optimization in a world of negative interest rates, forget Markowitz... you need to study the mercurial **Dennis Rodman**, former professional basketball player.



Dennis Rodman has always been a curious case to the power of the intangible. Rodman is (sadly) best known for his flamboyant behavior, tattoos and piercings, weird haircuts, and gonzo diplomacy to North Korea. He once wore a wedding dress to a press conference, dated Madonna, and sang ‘Happy Birthday’ to Kim Jong-Un. Rodman is currently the lowest scoring inductee in the Basketball Hall of Fame. Many question whether he is deserving of the honor. All of these facts obscure an important truth about Rodman. Modern statistical analysis makes a compelling case that, despite never averaging more than 11 points per game, Rodman was **one of the greatest to ever play basketball**. Seriously.

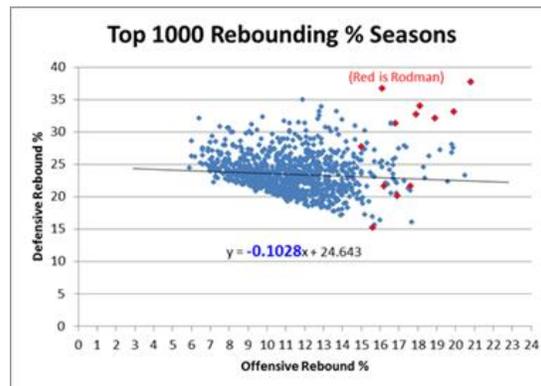
Rodman is, arguably, a top 20 player of all time, and easily one of the best of his era. Before you stop reading because you think this is crazy, let’s take a look at the hard statistics to understand Rodman’s underrated impact on the game.



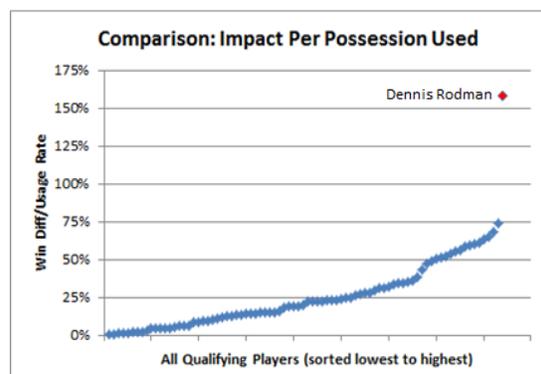
“I want to do for rebounds what Michael Jordan did for dunks.”

Dennis Rodman

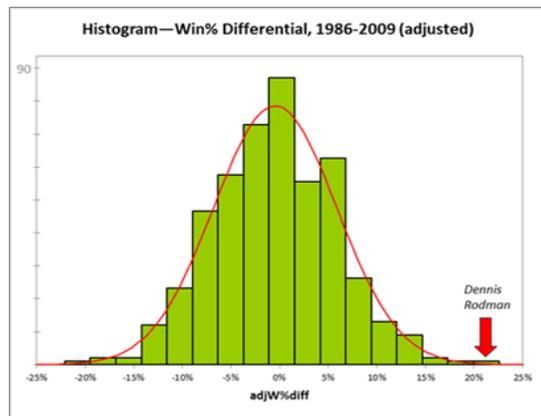
Rodman was better at rebounding relative to his peers than any other player at any other skill, including points and assists. At 6'7" in an era of powerhouse 7'+ centers, he garnered a remarkable and statistically unmatched 30% of the defensive rebounds, and 17% of offensive rebounds, while simultaneously guarding anyone from Magic Johnson to Shaq. He led the league in rebounding a record seven consecutive years. At his peak, he was over six standard deviations better at rebounding than anyone else in the league. In one game Rodman single handedly outrebounded the opposing team. No other player has ever achieved this degree of statistical separation in any other skill, even his three-time teammate, Michael Jordan.



Rodman dominated the game without scoring by dramatically improving the statistical efficiency of his teammates via rebounding and defense. His rebounding prowess on both ends of the floor resulted in countless second chance scoring opportunities and higher per possession utility. How many Michael Jordan jump shots, Isaiah Thomas layups, or David Robinson dunks began from a Rodman rebound? Rodman had a measurable impact on the per-possession efficiency of his team when played. Counter-intuitively, his team's shooting percentages improved dramatically when Rodman was on the floor despite the fact that he was a terrible shooter himself and rarely needed to be guarded!



Rodman tops the list of players with positive team margin of victory differential with him in the lineup vs. without him. Rodman could not shoot consistently outside of five feet, was incapable of carrying a team's offense by himself, however when paired with efficient scorers he amplified team offensive efficiency to a higher level. Rodman dramatically improved the win-loss record of every team he joined (vice versa for those he left) including a record setting 72 win 1995-1996 Chicago Team. In total, he was a key member of five championship teams, two of which are widely considered among the best ever.



Statistical analysis by Benjamin Morris – *Skeptical Sports Analysis* / <https://skepticalsports.com/the-case-for-dennis-rodman-guide/>

History and data shows that great defensive players like Rodman are the difference between mediocre and championship teams.

A **great defensive player** can dramatically increase the per possession efficiency of a team's offense, even if that player is subpar offensively.

Volatility and convexity exposure acts the same way for the institutional portfolio, dramatically increasing the risk efficiency of composite returns, despite flat to negative carry during bull markets.

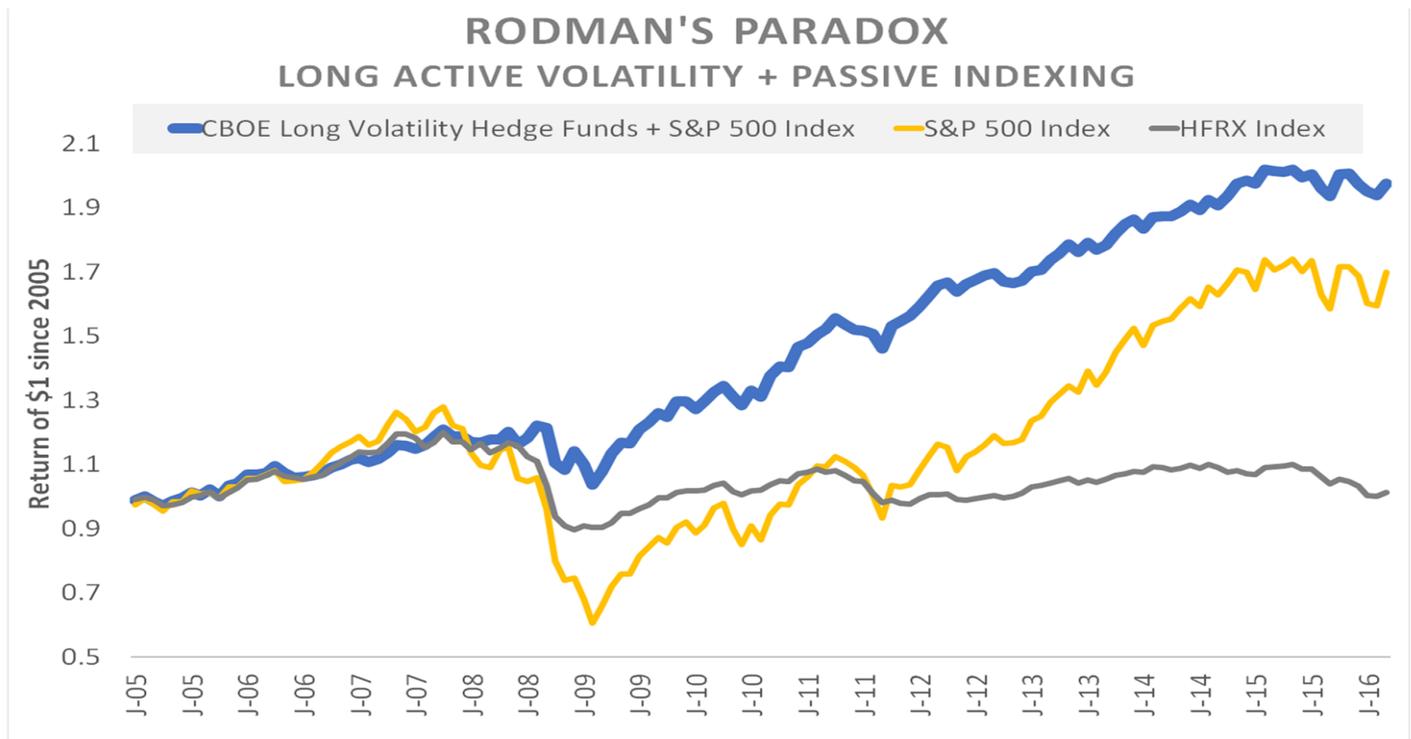


Rodman's Paradox

Rodman's Paradox describes hidden and non-linear benefits when adding a nonconformist but negative returning asset amplifies the output of a portfolio of positives. The sum is greater than the parts. The same way Dennis Rodman improves the efficiency of his teammates by rebounding their misses, the combination of active volatility exposure with traditional investments can generate impressive risk-adjusted returns by rebounding a portfolio from drawdowns.

Would you invest in an asset that has remained flat for years when the S&P 500 index has more than doubled? Most institutions would not, and most NBA general managers passed on selecting Rodman. The asset in question is the **CBOE Eureka Hedge Long Volatility Hedge Fund Index**, which tracks a basket of hedge funds that seek exposure to volatility and market crisis (Artemis Vega Fund, LP is a member of this index).

The recent multi-year performance of active long volatility is unimpressive, just like Rodman's scoring average, but look deeper: a simple 50/50 combination of the CBOE Long Volatility Hedge Fund Index and the S&P 500 Index since 2005 has dramatically outperformed both active and passive management. The 50/50 combined CBOE long volatility and S&P 500 index exposure beat the market by **+27%** and the average hedge fund by a whopping **96%** over this timeframe. The risk-adjusted returns of the volatility and passive index combination were over 2x the market. Do the math. The sum is greater than the parts.



Index	S&P 500 Index	50/50 CBOE Long Vol + S&P 500 Index	HFRX Global Hedge Fund Index
Total Return	69.96%	97.39%	1.35%
Annualized Return	4.86%	6.28%	0.12%
Volatility Per Annum	14.60%	7.09%	5.88%
Max Drawdown	-52.56%	-14.99%	-25.21%
Sharpe Ratio	0.40x	0.89x	0.05x
Sortino Ratio	0.51x	1.22x	0.05x
Return to Max Drawdown	0.09x	0.42x	0.00x

Note: 2005 to March 2016 with data from Bloomberg.

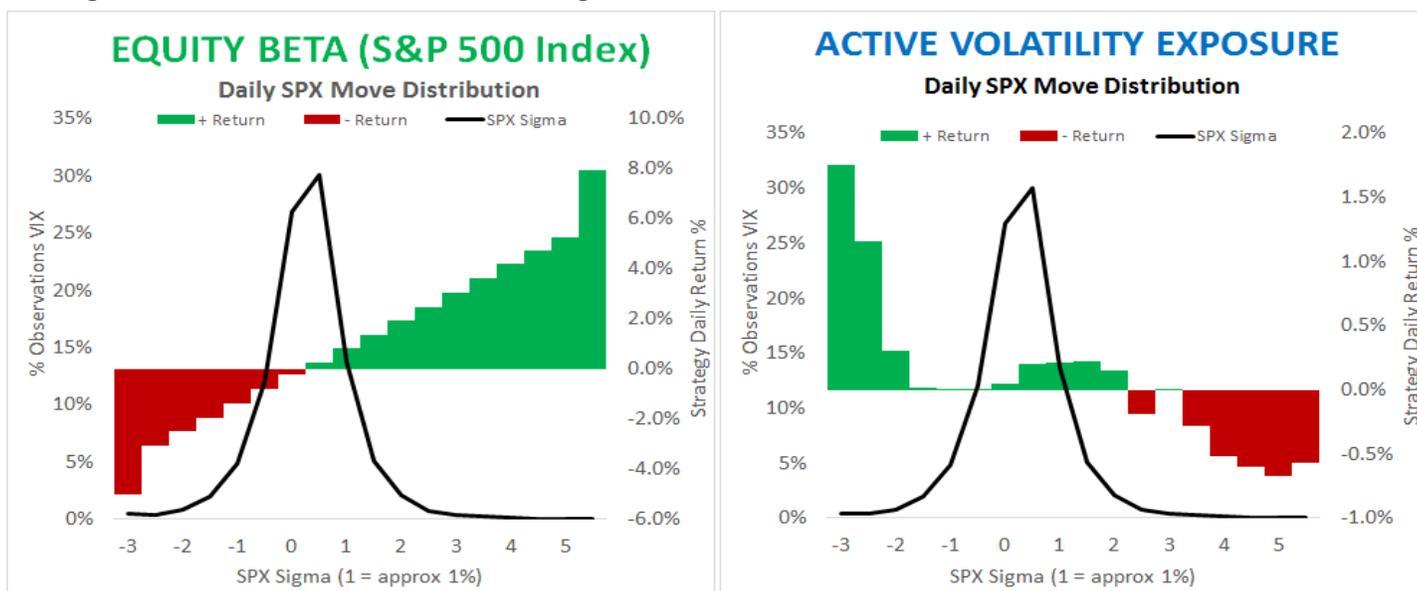


Long Volatility Rebounds when Stocks Miss

When your passive equity is underperforming, active long volatility will pick up the rebound and give you a second chance. A convex asset in the portfolio, despite relatively low scoring averages during bull markets, can be just as valuable to your portfolio as Rodman was to his championship teams. The convex asset that expands non-linearly during major linear declines in equity markets allows investors to:

- 1) Improve the risk-adjusted returns of a traditional basket of assets through portfolio optimization;
- 2) Maintain portfolio discipline and even profit from times of crisis;
- 3) Buy assets when they are below intrinsic value.

Consider that the majority of investments are negatively exposed to the left tail of the return distribution and positively exposed to the right tail. Active volatility and convexity based strategies are the opposite, providing some gains toward the middle, but massive gains on the left tail.



The secret to team success is a strategic combination of these two return paradigms. In many cases, volatility exposure may be layered or cross collateralized with traditional investments, at no lost opportunity cost. Institutions can use single managed accounts to access volatility at very high capital efficiency and liquidity.

Ironically, institutions would rather 'pay up' for mediocre offense just so they can have a positive line item on their books. I've listened to the heads of large institutions brag about how they will not tolerate negative or flat returns for any three-year period, despite the anti-correlated benefits. This is short sighted, no; let's just call it downright stupid.

It is no different in basketball. Rodman was a second round draft pick (27th overall), his unusual talents overlooked by countless teams that prioritized mediocre scoring over the intangibles of defense and rebounding. If the 1986 draft class was re-done, ex-post, experts agree he would have been the **unanimous top pick**. At the time, selecting Rodman as the #1 pick, a player who could not even score, was laughable. Perhaps as laughable as holding an anti-correlated asset that has not made returns for years on end. Nobody was laughing when Rodman helped Chicago and Detroit win five championship, and after the next financial crisis, I doubt people will be laughing at long volatility exposure that carried flat during the second longest bull market in history.

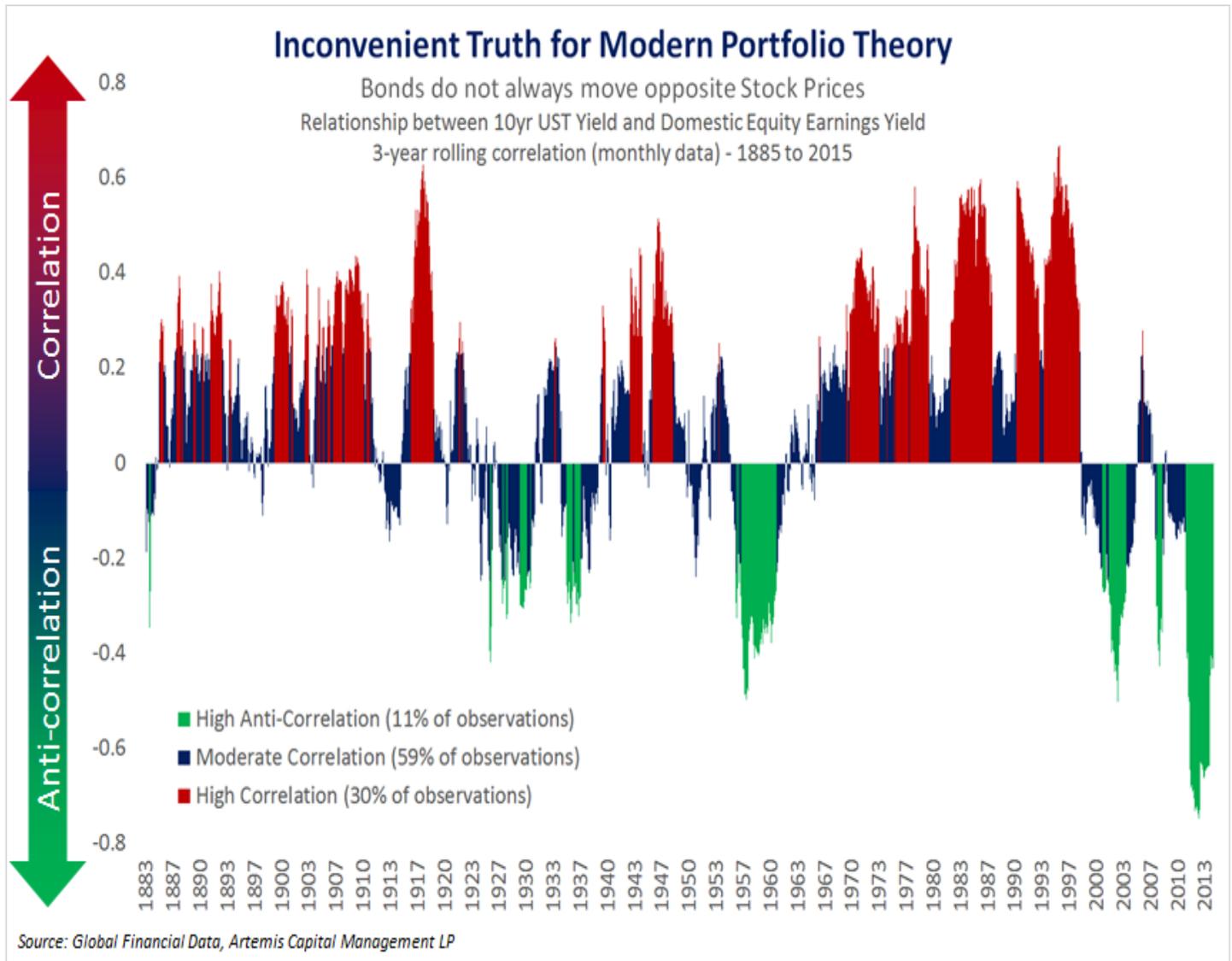


Fixed Income is a Dangerous Hedge

Many institutions prefer high quality fixed income to diversify equity exposure (rather than volatility) because it has a positive yield (for now). Fixed income has performed admirably as a hedge to equity during a three-decade collapse in rates; however, there are major flaws in overreliance.

The truth about the longer historical relationship between stocks and bonds is scary. Between 1883 and 2015 stocks and bonds spent more time moving in tandem (30% of the time) than they spent moving opposite one another (11% of the time). It is only during the last two decades of falling rates, accommodative monetary policy, and globalization that we have seen an extraordinary period of anti-correlation emerge between stocks and bonds unmatched by any other regime in history (see below). **Not only are stocks and bonds positively correlated most of the time but there is a precedent for multi-year periods whereby both have declined.**

In the event stocks and bonds simultaneously lose value, volatility will be the only asset class that is capable of protecting your portfolio.



Defense and Winning

Say what you will about Dennis Rodman – but you cannot deny the fact he was a winner.

Rodman was a core contributor on five championship teams. He dominated the game without scoring, but his basketball genius and value transcended box scores and simple statistics. In the same way, the value of active volatility management is not readily transparent as a three-year rolling performance line item.

Defense, intangibles, and anti-correlation are a tough sell – in basketball and in investing. Investors have trouble holding a flat to negative yielding asset in a bull market; the same way NBA teams have trouble selecting a player that can't hit free throws or three-pointers.



A defensive superstar alters the game, not by scoring, but rather by improving the efficiency of the scorers around him or her.

Volatility alters a portfolio, not by making money all the time, but by improving the risk-adjusted efficiency of other assets and creating new opportunities in bear markets.

The power of the defensive asset is underappreciated, in basketball and investing. NBA defensive and rebounding stars like Dennis Rodman, Ben Wallace, and Draymond Green were all overlooked second round picks, but all invaluable contributors to their respective championship teams.

Long volatility and tail risk strategies are now the least popular segment of the active investing universe, underappreciated and under allocated. **A second round pick at the end of a long bull market.**

As the Fed begins to unwind an unprecedented global monetary experiment institutions have picked a strange time to ignore portfolio defense and rebounding. If you want to win a championship – consider how volatility and traditional investments can work together to create a great team.

The sum is always greater than the parts.

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Photography from NBA photos, and reddit. Data from Bloomberg and Artemis Capital Management LP

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