



*The Do-It-Yourself
Market-Neutral Portfolio*

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The hedge fund business has been growing rapidly in recent years—with no end in sight. Wealthy investors are seeking alternative investments to meet their needs and hedge fund managers have an array of tools and strategies at their disposal. One of the core strategies employed by hedge funds is what is called *market-neutral* investing. A market-neutral portfolio is designed to deliver returns that are not impacted by the movements of the broader market. This does not mean that a market-neutral approach is low risk, however. Goldman Sachs (GS) largest hedge fund employs market-neutral strategies and has attributed their very poor recent performance partly to this approach:

<http://quote.bloomberg.com/apps/news?pid=20601087&sid=ahEQxh6jDuOI>

The defining objective of a market-neutral portfolio is that it's returns have low correlation to the broader market. Investors use such funds as a diversifier to their other investments in equities. Low-correlation between assets improves their diversification value. In practical terms, increased diversification means that you can achieve a higher return for the total amount of portfolio risk.

Market-neutral portfolios are achieved through a range of strategies. The simplest and best-known approach to market-neutral investing is to take long and short positions in stocks so that market exposure from the long positions is offset by the short positions. There are a number of mutual funds that exploit long-short strategies and this article is a good overview for the layperson:

<http://biz.yahoo.com/ibd/070417/funds.html?.v=1>

A list of top-performing long-short mutual funds can be found here:

<http://biz.yahoo.com/p/tops/lo.html>

Long-short portfolios tend to ride out market downturns quite well, but they tend to miss a fraction of the earnings growth in the companies that they invest in—simply because

some of their bets are short. The fees for gaining access to long-short portfolios tend to be high. Hedge funds typically charge substantial fees and the mutual funds that exploit this strategy are typically quite expensive. The Diamond Hill Long-Short Fund (DIAMX), for example, has an expense ratio of 1.5% and a front-end load of 5%.

There is another way to build a portfolio that is (almost) market-neutral that is much cheaper and quite simple. **It is possible to build a portfolio that exhibits very low correlation to the broader market (say the S&P500) in which there are no short positions—you simply use a carefully selected group of stocks that exhibit very low correlation to the broader market and, ideally, to each other.** The effectiveness of such an approach will surprise many people, but I have been studying this type of portfolio for some time and this is not a fluke:

<http://seekingalpha.com/article/23986>

I have built a sample (almost) market-neutral portfolio by screening for stocks and closed-end funds (CEF's) that have moderate or low price-to-earnings ratios (P/E) as well as low Betas. I wanted to look at some stress tests during the last bear market, so I also wanted companies with at least eight years of data. In the next step, I rejected a set of these stocks and CEF's that were in the higher levels of R-squared (also written as R^2) for the group and some that exhibited correlations to other portfolio components that were a bit high. I ended up with a portfolio of twenty components and I am decided to test the performance of a simple-minded portfolio with equal allocation to each—this is our model market-neutral portfolio:

Ticker	Company	P/E	Beta	Description
BPT	B P PRUDHOE BAY UTS	7.8	19%	Canadian royalty trust in oil
CEF	CENTRAL FD CDA CL A	5.8	17%	Canadian closed end fund investing in Gold and Silver
DNP	DNP SELECT INCOME FD	5.1	35%	Closed end fund in telecom, gas, and utilities
OMM	O M I CP NEW	6.5	22%	Seaborne shipper of oil and petrochemicals
PDS	PRECISION DRILL TRST	7.1	-28%	Services for oil and gas exploration & production
SAF	S A F E C O CP ##	8.4	-5%	Property and casualty insurance
VLO	VALERO ENERGY CP	8.1	17%	Oil refining and marketing/sale of products
VVR	VAN KAMPEN SR INCOME	14.0	1%	Closed end debt fund
PPR	ING PRIME RT TR SBI	12.5	5%	Closed end debt fund
NIO	NUVEEN INS MUNI OPP	14.1	5%	Closed end debt fund (mainly municipal)
ACG	ALLIANCEBERNSTEIN	12.3	8%	Closed end debt fund (mainly government)
EIX	EDISON INTL	14.9	9%	Electrical utility
HBAN	HUNTINGTON BCSHS	11.9	9%	Banking
STFC	STATE AUTO FINL CP	11.1	9%	Property and casualty insurance
SJT	SAN JUAN BASIN ROYAL	13.8	11%	Royalty trust in gas and oil
MITSY	MITSUI AND CO ADR	14.1	11%	Conglomerate
CMA	COMERICA INC	11.3	15%	Banking
FTO	FRONTIER OIL CP	10.8	15%	Oil refining and marketing/sale of products
BAC	BK OF AMERICA CP	10.9	32%	Banking
PCBC	PACIFIC CAP BNCP	14.4	26%	Banking

Stocks included (at equal weight) in our DIY market-neutral portfolio

If you have a look at these companies, several things become apparent. First, all of these selections have P/E ratios below the S&P500—which is above fifteen at the time of this writing. There is also quite a bit of concentration in terms of sectors. There is a major concentration in oil, refining, and related services such as drilling and shipping. There are a couple of property and casualty insurance firms. There are also four closed-end debt funds. The final major sector is banks. There is also a position in a CEF that invests in gold and silver. This specific list of companies is quite arbitrary, and is a result of the screening procedure—but it is a worthy case study.

First, let's look at the correlations between all of these stocks and funds over the last eight years (below). The first thing to understand is that these are correlations between monthly total returns---not prices. Correlations in returns between portfolio components determine how well your portfolio exploits diversification effects. The correlation matrix shows the correlation between the ticker in a column with the ticker in the intersecting row. The correlation of BPT (first column) with OMM (fourth row) is 37%, for example. The correlation of anything with itself is 100%, which is why the diagonal of a correlation matrix is always 100%.

	BPT	CEF	DNP	OMM	PDS	SAF	VLO	VVR	PPR	NIO	ACG	EIX	HBAN	STFC	SJT	MITSY	CMA	FTO	BAC	PCBC	
BPT	100%																				
CEF	5%	100%																			
DNP	13%	12%	100%																		
OMM	37%	10%	16%	100%																	
PDS	19%	11%	6%	56%	100%																
SAF	-21%	-10%	7%	-9%	5%	100%															
VLO	24%	0%	7%	44%	42%	-5%	100%														
VVR	24%	-2%	32%	10%	6%	-9%	3%	100%													
PPR	17%	0%	35%	4%	2%	-17%	3%	82%	100%												
NIO	9%	11%	56%	4%	-5%	-5%	1%	25%	28%	100%											
ACG	11%	-3%	51%	-1%	-5%	-3%	-2%	34%	39%	71%	100%										
EIX	-3%	-4%	16%	-11%	-16%	-17%	-11%	21%	15%	0%	14%	100%									
HBAN	-8%	0%	2%	-11%	1%	48%	-2%	11%	-3%	-1%	0%	2%	100%								
STFC	-12%	-3%	15%	5%	20%	23%	9%	3%	4%	3%	-5%	10%	16%	100%							
SJT	43%	5%	20%	33%	50%	1%	45%	8%	-1%	8%	7%	-2%	8%	20%	100%						
MITSY	4%	18%	22%	-10%	18%	-2%	21%	20%	16%	12%	17%	5%	4%	4%	14%	100%					
CMA	5%	-2%	22%	2%	10%	34%	-12%	43%	31%	14%	6%	23%	56%	26%	6%	8%	100%				
FTO	9%	-1%	11%	24%	32%	-6%	64%	-10%	-7%	11%	5%	-3%	1%	10%	32%	27%	-4%	100%			
BAC	-4%	0%	10%	4%	21%	46%	0%	41%	25%	9%	9%	-5%	55%	21%	7%	6%	60%	3%	100%		
PCBC	4%	4%	7%	-6%	-16%	3%	-23%	10%	13%	11%	12%	13%	13%	24%	-10%	-12%	12%	-7%	13%	100%	

Correlations in total returns from 5/1/1999 through 4/30/2007

There are some very low correlations between stocks and CEF's that are ostensibly in the same industry. BPT and SJT are both oil royalty trusts, but they have a correlation in returns over the last eight years of only 43%. Many of these stocks have maximum correlations to other portfolio components of less than 30%, with median correlations far below this level. Companies that are in the same sector may exhibit low correlation to each other—depending on industry. The typical correlations between broad market sectors are far higher than most of the correlations shown here. The correlation between the S&P500 and EAFE index, for example, is around 75%-80% and the correlation between the S&P500 and the NASDAQ index is greater than 85%:

<http://etf.seekingalpha.com/article/18817>

The chart above shows that the correlations between these stocks and funds have been very low over the past eight years. An issue that has gotten some attention is whether correlations between certain sectors are increasing in time. If true, this would make portfolio diversification based on history appear more effective than it will be in the future. Fortunately, this is easily analyzed. In the tables below, I show the correlation

matrix for the same tickers, but having generated one matrix for the first four years of the period (May 1999 through April 2003) and another matrix for the later four years (May 2003 through April 2007). If you examine the numbers, you will see that plenty of the correlations have changed between the first and second four-year periods. This is not crucially important for the portfolio, however. The average change in correlation between portfolio components is zero. If we saw an average change in correlation that was greater than zero, we might conclude that there was a trend towards more correlation between these stocks (and vice versa). There is no trend towards increasing correlation in this portfolio. The median change in correlation between any two of these stocks and funds is a 2% decrease.

Looking at changes in correlation in different time periods can be important. If correlation effects are increasing in time, your portfolio is getting less diversified in time—something you do not want to see. Ideally, on a portfolio basis, no such trend will show up. The stability of the overall correlations is a good sign for this portfolio. The fact that the correlations are so low for a number of companies in the same industry does bear some careful thought. Over the eight years of data in this analysis, the average return for companies in the oil industry has been higher than in many longer periods, and the average return is not a component of correlation. To make sure that this effect has not biased our correlation, I also had a look at fifteen years of history—going back to May 1992. The correlation between BPT and SJT, both oil royalty trusts, is lower for the fifteen year period than it has been in recent years (48% in the longer period and 64% in the most recent four years), but higher than the last eight years (43%).

	BPT	CEF	DNP	OMM	PDS	SAF	VLO	VVR	PPR	NIO	ACG	EIX	HBAN	STFC	SJT	MITSY	CMA	FTO	BAC	PCBC	
BPT	100%																				
CEF	3%	100%																			
DNP	16%	8%	100%																		
OMM	32%	9%	11%	100%																	
PDS	11%	12%	13%	59%	100%																
SAF	-16%	-15%	12%	-9%	10%	100%															
VLO	4%	-11%	12%	45%	41%	1%	100%														
VVR	25%	-6%	39%	8%	9%	-8%	-4%	100%													
PPR	25%	-3%	52%	6%	1%	-20%	3%	86%	100%												
NIO	2%	-10%	48%	0%	-10%	-3%	-1%	29%	47%	100%											
ACG	4%	-15%	50%	-7%	-14%	2%	-3%	39%	51%	76%	100%										
EIX	-18%	-10%	14%	-19%	-27%	-18%	-23%	25%	18%	-9%	9%	100%									
HBAN	-19%	2%	3%	-15%	3%	54%	2%	16%	0%	-3%	1%	1%	100%								
STFC	-21%	-10%	21%	7%	24%	33%	5%	6%	7%	13%	-7%	10%	20%	100%							
SJT	24%	2%	14%	32%	58%	16%	42%	5%	1%	-14%	-10%	-20%	5%	11%	100%						
MITSY	0%	3%	20%	-17%	15%	3%	15%	20%	14%	13%	26%	-4%	15%	-2%	15%	100%					
CMA	0%	-5%	23%	-1%	12%	38%	-16%	48%	35%	6%	1%	21%	56%	34%	-2%	8%	100%				
FTO	-7%	-14%	8%	25%	32%	-1%	65%	-8%	-3%	8%	4%	-11%	2%	10%	27%	29%	-6%	100%			
BAC	-4%	-3%	11%	2%	25%	51%	10%	52%	31%	11%	12%	-4%	63%	32%	18%	10%	65%	10%	100%		
PCBC	-7%	-6%	3%	-9%	-20%	-1%	-30%	26%	31%	10%	10%	14%	11%	31%	-19%	-20%	15%	-18%	19%	100%	

May 1999 - April 2003

	BPT	CEF	DNP	OMM	PDS	SAF	VLO	VVR	PPR	NIO	ACG	EIX	HBAN	STFC	SJT	MITSY	CMA	FTO	BAC	PCBC	
BPT	100%																				
CEF	10%	100%																			
DNP	5%	23%	100%																		
OMM	52%	18%	25%	100%																	
PDS	34%	13%	-13%	42%	100%																
SAF	-37%	-4%	4%	-3%	-11%	100%															
VLO	52%	12%	-1%	45%	49%	-28%	100%														
VVR	22%	5%	20%	14%	-7%	-15%	16%	100%													
PPR	0%	5%	-2%	-5%	5%	-5%	2%	70%	100%												
NIO	16%	35%	68%	10%	3%	-10%	4%	22%	1%	100%											
ACG	19%	22%	52%	16%	14%	-18%	2%	22%	7%	69%	100%										
EIX	37%	8%	21%	22%	26%	-10%	19%	2%	-7%	25%	39%	100%									
HBAN	10%	-4%	-6%	2%	-13%	26%	-16%	-11%	-15%	4%	-10%	-4%	100%								
STFC	-10%	20%	-7%	-14%	0%	-2%	22%	-8%	-6%	-17%	-14%	0%	-5%	100%							
SJT	64%	15%	21%	37%	36%	-33%	52%	13%	-8%	28%	30%	43%	11%	23%	100%						
MITSY	11%	36%	28%	7%	25%	-23%	28%	17%	21%	16%	4%	25%	-29%	23%	15%	100%					
CMA	14%	6%	23%	11%	-3%	10%	-7%	19%	13%	36%	27%	26%	57%	-9%	22%	3%	100%				
FTO	39%	18%	17%	24%	32%	-30%	65%	-14%	-22%	18%	8%	33%	-2%	15%	49%	21%	4%	100%			
BAC	-7%	10%	10%	16%	0%	17%	-34%	-4%	-3%	8%	-4%	-11%	11%	-21%	-22%	-6%	24%	-29%	100%		
PCBC	15%	18%	10%	-2%	-12%	16%	-13%	-15%	-16%	10%	13%	17%	22%	13%	-3%	1%	7%	9%	4%	100%	

May 2003 - April 2007

Correlations matrices for two four-year periods

Having established that there are no major trends in the correlations in this portfolio as a whole, we can look at the performance on an historical and projected basis—this is where things get interesting. I have analyzed this portfolio using Quantext Portfolio Planner (QPP), a portfolio planning tool that generates outlooks for portfolio volatility and return for individual assets and for total portfolios. QPP calculates both historical performance and an outlook using a specific historical period to generate the predicted performance.

The table below shows the results using QPP to generate an outlook for our portfolio using eight years of data as input (and all baseline settings for QPP). The *Portfolio Stats* table shows the predicted future average return and standard deviation in annual return. The *Historical Data* shows the historical performance.

Portfolio Stats	
Average Annual Return	Standard Deviation(Annual)
15.1%	12.5%
Historical Data	
Start: 5/1/1999	End: 4/30/2007
Average Annual Return	Standard Deviation (Annual)
20.5%	11.0%
Historical Beta: 32.5% Historical Yield: 4.7% Portfolio R ² : 17.4%	
Performance of S&P500 over historical period	
Avg Ann Return S&P500 (no dividends) 2.6%	
Annual Standard Deviation on S&P500 14.1%	

Trailing and projected performance of portfolio from eight years of data

Over the last eight years, the market as a whole has generated low returns (average annual return of 2.6% for the S&P500 before dividends). Even including dividends, the S&P500 has generated an average return of less than 4.5% per year. Our market-neutral portfolio has performed very well over this period, with average returns of 20.5% per year and with a lower volatility than the S&P500 (11% vs. 14.1% for the S&P500). The real proof that this portfolio is, indeed, market-neutral comes from looking at Beta and R-squared (R²). A perfectly market-neutral portfolio would have Beta of zero and R² of

zero. Our portfolio has Beta of 32% and R^2 of 17%. For purposes of reference, an S&P500 index fund would have Beta and R^2 of 100% and a government bond index fund would have Beta and R^2 of 0%. The values observed for our (mostly) market-neutral portfolio are very low. We could play with the allocations to try to get Beta and R^2 even lower, but this is not terribly practical. For investment purposes, we simply want a portfolio that weathers market downturns well---we are not worried about making a portfolio absolutely uncorrelated to the broader market.

Consider the historical and projected performance from QPP when we split our eight-year period into two four-year periods (below). When I ran QPP using market data from 5/1/1999 through 4/30/2003 as the only inputs, QPP generated the results shown on the left side of the figure below. This period encompassed our most recent bear market—note that the S&P500 returned -7.3% per year (before accounting for dividends) in this four-year period. This was also a high volatility period for the S&P500, with standard deviation in annual return of 18.2% (also shown below). Our market-neutral portfolio generated 16% per year, with a standard deviation of 12.6%---much higher return with lower volatility. Over this bear market, R^2 was about 19% and Beta was 30%. QPP's projection for the future performance of this portfolio was for an average return 14%, with a standard deviation of 11% (*Portfolio Stats*), using only the four years of data through 4/30/2003 as input.

When I ran the portfolio through QPP using historical data from 5/1/2003 through 4/30/2007 and all baseline settings, QPP generated the table on the right side of the figure below. Over this period, the S&P500 generated an average annual return of 11.3% per year (before dividends) --- about 13% per year when we include dividends—with a standard deviation of 7.3%. The market-neutral portfolio generated an average annual return of 23.8%, with a standard deviation of 8.95%. This four year period has been characterized by fairly high average returns but, more significantly, very low market volatility—as evidenced by the low standard deviation. Recent years have seen market volatility that is historically low. This portfolio has generated annual returns that are much higher than we can expect for this volatility level—and something will have to

give. QPP, using data from this most recent four years, predicts that this portfolio will generate returns of 21% per year, but with volatility that is slightly more than twice what we have seen over the past four years. When we used the entire eight-year period, QPP projected an average annual return of 15% per year, with a standard deviation of 12.5% (see previous chart). These results provide a reasonable range for what might be expected in the future from this portfolio.

Portfolio Stats		Portfolio Stats	
Average Annual Return	Standard Deviation(Annual)	Average Annual Return	Standard Deviation(Annual)
14.05%	11.12%	21.14%	19.08%
Historical Data		Historical Data	
Start: 5/1/1999	End: 4/30/2003	Start: 5/1/2003	End: 4/30/2007
Average Annual Return	Standard Deviation (Annual)	Average Annual Return	Standard Deviation (Annual)
16.02%	12.59%	23.78%	8.95%
Historical Beta: 30.20% Historical Yield: 5.13% Portfolio R ² : 19.1%		Historical Beta: 36.57% Historical Yield: 4.22% Portfolio R ² : 8.9%	
Performance of S&P500 over historical period		Performance of S&P500 over historical period	
Avg Ann Return S&P500 (no dividends) -7.29%		Avg Ann Return S&P500 (no dividends) 11.31%	
Annual Standard Deviation on S&P500 18.22%		Annual Standard Deviation on S&P500 7.32%	

Historical and projected performance for the portfolio for two four-year periods

Over the most recent four years, the portfolio has exhibited even lower R² (8.9%), but slightly higher Beta, than we saw over the previous four years. R² (R-squared) measures that percentage of the variability in a portfolio that can be explained by the movement of the broader market. These results mean that less than 9% of the

performance of this portfolio is due to movements in the S&P500 in the last four years. R^2 is higher for the bear market period, but still very low at 19% (see table above). Even during this bear market, less than 20% of the returns of this portfolio were driven by the broader market. The R^2 value for this fund is less than the R^2 for DIAMX, for example, despite the fact that DIAMX takes short positions and also has a concentration in energy.

While our simple portfolio is obviously not perfectly market-neutral, it has generated very solid returns in recent bear and bull markets and the R-squared of this portfolio has been very low in both situations. It is certainly possible to ‘tune’ this portfolio or one like it to be perfectly neutral on an historical basis but this may not be productive because we would end up over-tuning to history.

Using three sets of historical data (the eight years and the two four-year sub-periods), QPP projected that this portfolio would generate average annual returns that are slightly greater than the projected standard deviations in annual return. As I have discussed previously, this is about as good a return-to-risk ratio as you can realistically plan for, even if trailing performance is much higher relative to volatility:

<http://etf.seekingalpha.com/article/21808>

If you want the general features of a market-neutral strategy, you could do a lot worse than following the general strategy shown here. Please understand that I am not advocating this specific portfolio---each investor must consider the specific themes that he or she wishes to pursue. The strategy outlined here is not limited to this specific set of stocks---this is just an example. My principal point here is that you do not need to invest in a hedge fund or a long-short fund to garner the benefits of de-coupling your portfolio from the gyrations of the major market indices. This type of almost-market-neutral approach can be used to manage the total market sensitivity of a portfolio at very little cost.

Note: all calculations performed here and all tables were generated using Quantext Portfolio Planner with standard settings.

Quantext Portfolio Planner is a Monte Carlo portfolio management tool. Extensive case studies, as well as access to a free extended trial, are available at <http://www.quantext.com/gpage3.html>