



Reexamining Bill Gross' Decision to Sell Treasury Bonds

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Bill Gross made headlines in February by asserting that U.S. Treasury bonds were not providing enough yield to make them worth the risk and [reducing](#) his allocation to zero in the PIMCO Total Return Fund (institutional share class PTTRX). The subsequent rally forced him to admit his mistake in August, but by then his fund was [trailing](#) 90% of its peers and having its [worst](#) year since 1995. I will examine Gross' February decision in retrospect, to illustrate its tactical and strategic costs and benefits for his shareholders.

With approximately \$245 billion in assets, PTTRX is the world's largest fund and Gross' moves are watched closely on every bond market desk. Some might consider him the personification of the bond market vigilante. Did Gross make the classic error of trying to 'fight the Fed'? Did he forget Keynes' famous [adage](#) that 'the market can remain irrational longer than you can remain solvent'? Or was his reasoning simply flawed?

An [article](#) that follows the evolution of Gross' strategy from earlier this month provided an overview of the situation. Gross said that Treasury bonds were providing low yield for the interest-rate risk associated with those bonds. In contrast, the risk in corporate bonds is primarily credit risk. He looked at the relative yield-to-risk across fixed income investments and concluded that credit risk in corporate bonds was better compensated than interest rate risk in Treasury bonds.

To pursue this strategy, Gross reduced its exposure to Treasury bonds and invested heavily in corporate bonds. His positioning was a tactical bet that interest rates could not remain at their near-historical lows. As we all know with hindsight, rates could and did stay this low—and even went lower.

Let's look closely at Gross' decision to bet against Treasury bonds by applying a series of statistical tools to the data that was available to Gross in February 2011.

Analysis of PTTRX

The table below compares PTTRX to a number of core fixed-income asset classes, represented with ETFs. The calculations are shown using data available through February 2011 to see whether these measures would have provided any warnings of the coming rally in Treasury bonds and relatively poor performance in corporate bonds

PTTRX is classified as an intermediate-bond index, and the Barclays Capital U.S. Aggregate Bond Index is the [common benchmark](#). The ETF that tracks this index is AGG.



PIMCO Total Return Fund vs. Fixed Income Assets (three years through Feb 2011)

	Ticker	Correlation to PTTRX	Beta vs. S&P500	Volatility	R ² vs. S&P500
PIMCO Total Return Fund	PTTRX	100%	9%	5%	17%
20+ Year Treasuries	TLT	39%	-15%	18%	3%
7-10 Year Treasuries	IEF	47%	-7%	9%	3%
1-3 Year Treasuries	SHY	27%	-2%	2%	11%
Corporate Bonds	LQD	87%	21%	12%	14%
High Yield Corporate Bonds	HYG	60%	66%	19%	56%
Aggregate Bond Index	AGG	80%	6%	5%	5%

The descriptive statistics are quite telling. First, the historical volatility of PTTRX is low – consistent with AGG, and lying between short-term (1-3 year) and medium-term (7-10 year) Treasury bonds.

While its volatility is consistent with AGG, PTTRX faced very different types of risk from that ETF and from Treasury bonds. Corporate bonds had the highest correlation to PTTRX over the three-year period. Both AGG and PTTRX had modest positive betas, but PTTRX had a higher beta with respect to the S&P 500. As a result, one would expect the future performance of PTTRX to be far more dependent on the returns from the S&P 500 than on the aggregate bond index (AGG).

In this table, R-squared (R²) measures the fraction of the variance in returns in each asset class or fund that can be explained by moves in the S&P 500. The R-squared for PTTRX is 17%, versus 5% for AGG. PTTRX was positioned to out-perform the aggregate bond index if equities performed well – and underperform if they struggled. The total return for the S&P 500 from the end of February through August of 2011 was approximately -7%, so the correlation to the S&P 500 was a drag on PTTRX's performance.

It is surprising that the R-squared for PTTRX was higher than that of the corporate bond index (LQD), since when stocks are doing well, corporate bonds are more likely to do well. A bond fund that contains some mix of corporate bonds and other bond classes should tend to have lower R-squared than an index of corporate bonds alone. But this was not the case with PTTRX. These results indicate that Gross' fixed-income allocation for the fund had higher exposure to the performance of equities, but we do not know why.

These results raise another important issue. The low correlation between PTTRX and Treasury bonds says that PTTRX would be better diversified if it held some Treasury bonds. Adding asset classes with low correlation to a portfolio will usually increase return without increasing risk. For fixed-income portfolios, I have proposed that looking at yield



versus risk is the best [measure](#) of effective diversification. Was PTTRX providing the maximum yield for its risk level as of the end of February? Would PTTRX have had a higher yield-to-risk ratio with some allocation to Treasury bonds? I tested this using Quantext Portfolio Planner (QPP), a Monte Carlo portfolio management tool.

QPP uses historical data as input and projects the volatilities of individual assets and for entire portfolios. The projected volatility for the total portfolio is dependent on the correlations between asset classes. I used QPP to determine the projected volatility for PTTRX as of February 2011, as well as for portfolios that hold a combination of PTTRX and the three Treasury ETFs (TLT, IEF and SHY). The purpose of the analysis was to see whether I could build a portfolio with projected risk equal to that of PTTRX, but with an equal or higher yield. If so, having zero allocation to Treasury bonds at the end of February was clearly not optimal.

Optimized Portfolios for Yield vs. Risk (data through February 2011)

Portfolio	Yield	Projected Volatility	Beta	Correlation to AGG
100% PTTRX	2.87%	3.16%	8.5%	80%
76% PTTRX / 24% IEF	2.90%	3.16%	4.5%	90%
87.5% PTTRX / 9.2% IEF / 3.4% TLT	2.92%	3.16%	6.4%	89%

I ran an optimizer with QPP to maximize yield with a risk constraint that the projected portfolio volatility would be no greater than the projected volatility of PTTRX. I allowed the optimizer to build a portfolio using PTTRX and the three Treasury ETFs. I also ran a case with PTTRX and only the intermediate Treasury ETF (IEF).

The table above shows the portfolios. The optimizer was not able to identify portfolios with substantially higher yield than PTTRX at the same risk level. That said, the optimal portfolio solution would have held 12.6% of its portfolio in Treasury bonds (9.2% in IEF and 3.4% in TLT). In other words, the portfolio created by the optimizer, when the goal is to attain the highest level of yield for the same risk level as PTTRX, has a 12.6% allocation to Treasury bonds. The very small advantage in yield, taken in the context of model uncertainties and approximations, cannot be considered conclusive. Both optimal portfolios are more highly correlated with AGG than PTTRX. While QPP has no information as to the underlying holdings of AGG, or that AGG is a bond fund benchmark, the portfolio optimized to provide maximum yield versus risk tends to track the benchmark more closely than PTTRX. This highlights how a strong a tactical bet Gross was making with PTTRX.

Gross' decision to reduce his exposure to Treasury bonds and increase his exposure to corporate bonds was a tactical decision based on a forecast of near-term interest rates, rather than a strategic one. On the basis of strategic asset allocation (the yield-versus-risk analysis), a substantial allocation to Treasury bonds would have provided just as much



yield at the same level of risk. On the other hand, Gross positioned PTTRX so that was no worse from a strategic asset allocation perspective, despite his selling Treasury bonds.

When I ran the optimization using data available through the end of August 2011, I obtained the following results:

Optimized Portfolios for Yield vs. Risk (data through August 2011)

Portfolio	Yield	Projected Volatility	Beta	Correlation to AGG
100% PTTRX	2.72%	3.15%	8.8%	77%
90.9% PTTRX / 5.3% IEF / 3.8% TLT	2.75%	3.15%	6.9%	87%

Some additional exposure to Treasury bonds is still justified on the basis of strategic considerations. Given that PTTRX rapidly increased its stake in Treasury bonds in August, there may not yet be enough performance history with this higher allocation to fully show how the fund is different today. While Gross has reduced his fund’s exposure to interest rates since February, he has increased the fund’s beta with respect to the S&P 500, making it more sensitive to moves in large-cap equities. While a beta of 8.8% is not that high, it is meaningful. The market conditions of the recent six months, with high equity volatility and rallying Treasury bond prices, have been the worst possible conditions for PTTRX.

Discussion

There are two distinct considerations that bear on a fixed income portfolio’s allocation to Treasury bonds. The first of these is that the yield on Treasury bonds has been very low relative to their associated risk. In an [article](#) in October 2010, I showed that Treasury bonds were delivering lower yield relative to their risk than corporate bonds, which was precisely the basis of Gross’ argument that credit risk looked more attractive than interest rate risk in February.

The other piece of the argument, however, is that even if an asset class looks unattractive on a standalone basis, it may still be desirable for its portfolio diversification effects. As I noted in my [article](#) on this topic in May of 2011, “The fact that long-term government bonds looked unattractive on a standalone basis back in October 2010 did not suggest that there was no place for an investment in this asset class.”

Because of the value of diversification, the optimal income portfolios in October 2010 included allocations to Treasury bonds even though they were overvalued when viewed in isolation.

With my analysis of PTTRX using data through February, the picture was more nuanced. When I created optimized portfolios that combined PTTRX with allocations to Treasury



ETFs, I did not identify portfolios with meaningfully higher yields at the risk level of PTTRX. In fact, while the optimal portfolios had substantial allocations to Treasury bonds, their yields were essentially identical to that PTTRX. My view, therefore, there was no clear strategic imperative for Gross to have held Treasury bonds.

The optimal portfolios, though they had almost identical yield and risk projections as compared to PTTRX, had some notable differences. First, the optimal portfolios were more highly correlated to AGG. Second, the optimal portfolios had higher interest rate risk, because of their exposure to Treasury bonds.

The result of Gross' decision in February to reduce interest rate risk and increase credit risk was that PTTRX had higher exposure to equity risk (as expressed in its beta). While Treasury bonds typically have zero or slightly negative betas, corporate bonds have modest positive correlations to equities. The tradeoff between rate risk and credit risk was quite substantial, and it did not pay off.

So what is our take-away? First and foremost, Gross performed a nuanced reduction of interest rate risk and increase in credit risk, resulting in a portfolio with the maximum available yield for the risk level. But over a very short period this tactical bet went bad. Gross was not secretive about his position that he preferred credit risk to interest rate risk, which flows naturally from the 'New Normal' paradigm that he and PIMCO have developed. Substantial inflation is one of its [core precepts](#), and it follows that managers should reduce interest rate exposure.

Gross did exactly what his outlook suggested he should do. He took a tactical position without giving up any yield or taking on any additional risk. In doing so, however, he increased his tracking error relative to his benchmark (recall the lower correlation between PTTRX and AGG). The tactical reduction in Treasury exposure resulted in an increase in exposure to equity market volatility. Over the next six months, Treasury bonds rallied and equities declined, with the unsurprising result that PTTRX exhibited poor relative performance.

Over a longer horizon, however, Gross' positioning of PTTRX should have produced positive results relative to his benchmark. Credit risk provides more yield at a given risk level than Treasury bonds. The problem for Gross is that mutual fund investors are not a patient lot and, as the person at the helm of the world's largest mutual fund, his short-term performance gets considerable scrutiny.



Geoff Considine is founder of Quantext and the developer of Quantext Portfolio Planner, a portfolio management tool. More information is available at www.quantext.com.

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