

Portfolio Diversification with Gold, Silver, and Platinum

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Executive Summary

This paper investigates the role of precious metals in a strategic asset allocation, more specifically the role of gold, silver, and platinum bullion. It addresses the fact that relatively little research has been done on the role of precious metals in a strategic asset allocation.

Particular detail is spent on the correlations of precious metals with traditional asset classes and how this relates to diversification. From 1926 to 1969, the correlation between annual total returns for U.S. stocks and U.S. bonds was an attractive -0.02 . Recently, U.S. stock market and U.S. bond market correlations have increased. This tendency is reflected in the 10-year rolling correlations from 1970 through 2004 that ranged from -0.03 to 0.80 . The possible increase in correlations, in combination with attractive returns observed in other asset classes, drives the vigor with which opportunities in non-traditional (or alternative) asset classes have been pursued in recent years. The primary method for improving the risk-return characteristics of the efficient frontier is to expand the opportunity set of available asset classes.

The role of precious metals in a strategic asset allocation is explored using mean-variance optimization. Efficient frontiers with and without precious metals are compared. The efficient frontier analysis is done once using pure historical inputs and once using a set of forward-looking inputs.

Since an investment in commodity related stocks does not provide a direct or pure asset class exposure to commodities, the paper focuses on a direct, physical investment in an equally-weighted portfolio or composite of gold, silver, and platinum bullion. We constructed an equally-weighted composite index using gold, silver, and platinum bullion price returns and examined the 33 year period from February 1971 to December 2004. We refer to this equally-weighted composite as the Spot Precious Metals Index (SPMI) and we use it as a proxy for the precious metals asset class.

While the three constituents are all precious metals, gold and silver are often viewed as a safe harbor during times of crisis. Conversely, during an economic expansion demand for silver and platinum is thought to increase.

Over the entire 33 year period, the three equity asset classes outperformed the other asset classes. The overall performance of the SPMI was closer to the fixed income asset classes. The SPMI outperformed both cash and inflation. For over 11 years (May 1973 to August 1984) the SPMI was the top performing asset class, with the longest run of any of the asset classes. During the low inflation period, the SPMI had the lowest compounded annual return. During the high inflation period, the compounded annual inflation rate was 8.62% and the SPMI had the highest compounded annual return of 20.83% . For the period studied, precious metals provided a substantial hedge against inflation.

While the standard deviation of the SPMI is quite high in isolation, according to modern portfolio theory it is the interaction of asset classes with each other that provides diversification. Of the 33

years of annual data, there were nine years that U.S. Large Cap stocks had negative returns. During these nine years, the SPMI had the highest average arithmetic return.

Of the 33 years of annual data studied, there were six years that an equally weighted portfolio of traditional asset classes had negative returns. The average arithmetic return of the portfolio of equally weighted traditional asset classes for these six years was negative 3.5%. For the same six years, the average arithmetic return of the SPMI was a positive 13.4%. Precious metals provided positive returns when they were needed most.

Of the seven asset classes, the precious metals asset class is the only one with a negative average correlation to the other asset classes. It is also worth noting, excluding cash, precious metals is the only asset class with a positive correlation coefficient with inflation, which is further evidence that precious metals act as a hedge against inflation.

Low correlations between asset classes are the basis for diversification. Unfortunately, correlations between traditional asset classes may be on the rise.

The historical efficient frontier with precious metals was superior to the historical efficient frontier without precious metals. With the exclusion of the maximum return asset allocation, including precious metals in the opportunity set improved the risk-return tradeoff over the entire historical efficient frontier. Importantly the allocation to precious metals does not come at the expense of any single asset class, but rather it comes from a reduction in several asset classes. This suggests that the unique risk and reward profile of precious metals may make it a useful diversification tool in strategic asset allocations moving forward.

Based on the historical efficient frontiers, we found that including precious metals moderately improved the efficient frontier. Allocations ranged from approximately 0% to 9%.

Based on the forward-looking resampled efficient frontiers, asset allocations that include precious metals have better risk-adjusted performance (as measured by the Sharpe Ratio) than asset allocations without the precious metals. Investors can potentially improve the reward-to-risk ratio in conservative, moderate, and aggressive asset allocations by including precious metals with allocations of 7.1%, 12.5%, and 15.7%, respectively. These results suggest that including precious metals in an asset allocation could increase expected returns and reduce portfolio risk.

For the series that we studied, including precious metals in the asset allocations increased the skewness of the return distributions, which indicates an increase in upside exposure and a decrease in downside exposure. Including precious metals in the conservative asset allocation resulted in an asset allocation with less excess kurtosis; for the moderate and aggressive asset allocations, including precious metals slightly increased the excess kurtosis.

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