HCWE
Worldwide Economics

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Strategic Asset Selector

A powerful way to stabilize the performance of a US stock portfolio

Investors will always want lower volatility than equity markets can give them. Over the years, fund managers have come up with numerous strategies to address this need, but within the stock-market universe the scope for reducing volatility is limited. Returns from different equity flavors are positively and highly correlated.

Over the past 45 years, it's tautologous to say that a 50-50 mix of the S&P 500 and EAFE (developed-world equity markets outside North America) is more "diversified" than the S&P 500 alone. Nonetheless, the year-to-year stability of its performance is not any better. As a result of the fact that EAFE is more volatile than the S&P, the mix actually has higher volatility than the S&P.[1]

It's not possible to reduce the general market risk of a stock portfolio just by adding more and different equities. Treasuries or other high-quality bonds don't help much either: their performance correlations with equities are variable but positive most of the time.

What's needed is to mix in one or more other completely different asset classes with which stocks happen to have inverse correlations. That would place the focus on haven assets such as physical gold and possibly other "real" assets such as commodities or commercial real estate. The more intense the *inverse* correlation, the more portfolio volatility can be reduced. In this report we explore the extent to which gold, a basket of commodities, or T-bonds can stabilize US equity portfolios.

... gold is the primary asset whose performance correlations with US stocks are generally most inverse.

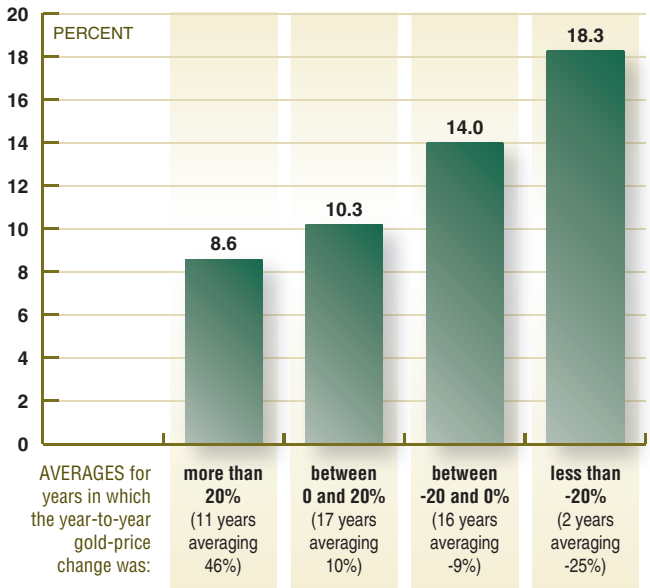
Performance correlations between US equities and other asset classes. Performance correlations are extremely dependent on the unit of time. Though widely advertised and used, monthly correlations are hardly relevant at all.[2] Investors whose time horizon is annual or multi-annual need to target volatility over annual or multi-year time frames as well. And that means concerning themselves with correlations calculated over the same time frames.

With this in mind, Table 1 shows correlations among one-year, three-year and five-year returns from five asset classes. We can see from these data that there is scope for reducing volatility by

Figure One

The Inverse Annual Performance Relationship between US Stocks and Gold

calendar-year average data from the end of 1969



Data: Calendar-year averages of month-end total return indices from the S&P 500 companies (University of Chicago/Dimensional Fund Advisors) and spot prices for gold (*Metals Week*).

1. See "Would foreign stocks further diversify a diverse mix of domestic asset classes?" *Strategic Asset Selector*, HCWE Inc., February 28, 2015.
2. "What investors don't know about asset correlations could be vital," *Strategic Asset Selector*, HCWE Inc., May 21, 2014.

Table 1

Performance Correlations among Five Major Assets

from the end of 1969

	S&P 500	*long T-bonds*	*gold*	*commodities*	*EAFE*
a) calendar-year returns through the end of 2014					
S&P 500	–	0.02	–0.23	0.01	0.66
long T-bonds	–	–	–0.17	–0.45	–0.14
gold	–	–	–	0.60	–0.01
commodities	–	–	–	–	0.12
b) three-year returns through the end of 2014					
S&P 500	–	–0.11	–0.51	–0.22	0.51
long T-bonds	–	–	–0.32	–0.42	0.18
gold	–	–	–	0.60	0.12
commodities	–	–	–	–	–0.09
c) five-year returns through the end of 2014					
S&P 500	–	0.45	–0.67	–0.70	0.51
long T-bonds	–	–	–0.56	–0.57	0.72
gold	–	–	–	0.97	–0.19
commodities	–	–	–	–	–0.19

Data: Month-end total-return indices for the S&P 500 and long Treasury bonds (University of Chicago/ Dimensional Fund Advisors) and for EAFE stocks (Morgan Stanley Capital International); and month-end spot prices for gold (*Metals Week*) and an equal mix of copper, corn, cotton and crude oil (Reuters Bridge Commodity Research Bureau/Quandl).

adding gold or commodities to a portfolio of US stocks, especially for longer time frames. Correlations with long T-bonds or foreign stocks (EAFE) are mostly positive.

Low-volatility mixes of US stocks and gold. One of our reports earlier this year set the scene for a more realistic view of the tradeoff between risk and return, pointing out that:

"In a prior era in which investment portfolios were largely limited to equities, bonds and cash, the idea that volatility is the price of return was apparent to everyone. That is still a deeply embedded belief throughout the investment community. But the introduction of additional asset classes in the passing years has revealed a more favorable tradeoff between return and volatility. Using widely divergent asset classes, a fund manager can achieve low volatility in a multi-asset context with surprisingly little sacrifice of return."[3]

That "prior era" was the period beginning at the start of the 1970s, an era in which the gold value of the dollar was constant. Since stocks and bonds were effectively denominated in gold, they were not vulnerable to depreciation in the currency as occurred repeatedly in many other countries. Price volatility due to currency instability barely existed, and the need that exists today to include hard or foreign assets in portfolios to offset such volatility was absent.

According to the correlations in Table 1, gold is the primary asset whose performance correlations with US stocks are generally the most inverse. Figure One on the front page illustrates the correlation between annual returns from the S&P 500 companies and contemporaneous price changes in gold in the form of a bar chart.

The mechanism that generates this relationship is most easily explainable in terms of the natural migration of capital among asset classes. A fall in the purchasing power of the dollar in terms of foreign currency implies the onset of instability in the dollar, which induces capital to migrate to more stable currency zones. Symmetrically, a rise in the dollar's foreign-currency value implies a return toward stability in the dollar and induces capital to migrate back to the USD zone.

Thanks to the intensity of the inverse stocks-gold correlation, some mixed portfolios of stocks and gold have substantially lower volatility than either asset class alone. This is illustrated in Figure Two. The results are similar in some ways to those in our earlier paper on mixes of emerging-market equities and Treasury bonds, cited in footnote 3.

Relatively small percentages of gold in the mix reduce volatility substantially. For example, the left panel shows that an 80-20 mix of stocks and gold has 20 percent less volatility than a portfolio of 100 % stocks. And this is accompanied by an *increase* in compound annual return!

Downside volatility (the left-half of the frequency distibution of returns) is of even more concern to investors than overall volatility. If we focus instead on the downside, the benefit is even greater. An 80-20 mix has one third less downside volatility and a 50-50 mix has less than half the downside volatility of a pure stock portfolio.

Asset mixes with increased return explained in terms of "volatility drag." It may appear astonishing at first that a mix of 80% equities and 20% gold could have a higher rate of return than either stocks or gold alone. The reason for this is mathematical, traceable to the difference between simple and compound interest in calculating the rate of return from volatile investments.

The simple mean of annual returns always exceeds the average compound

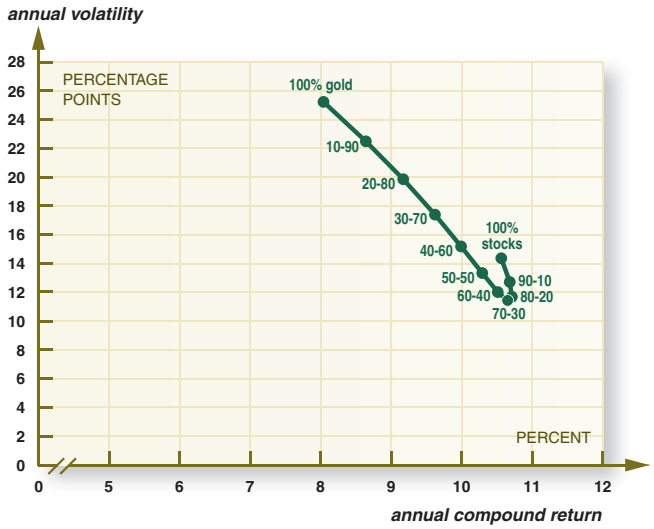
3. "An asset-mix strategy to alleviate future emerging-markets disappointments," *International Forecaster*, HCWE Inc., March 31, 2015, p.3.

Figure Two

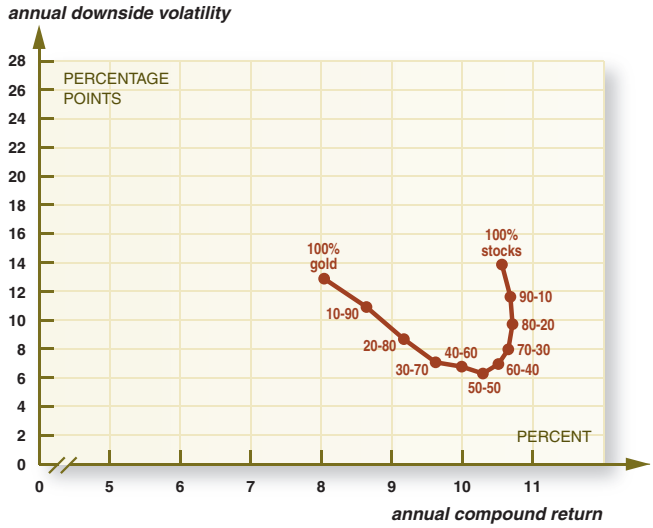
Annual Return and Volatility for Mixes of the S&P 500 and Gold

calendar-year average data, annual rebalancing, since the end of 1969

a) annual volatility



b) annual downside volatility



Data: As for Figure One.

rate of return if the portfolio has any variability at all. For example, over the past 45 calendar years, the simple mean return from the S&P 500 was 11.95 percent, while the compound rate of return was 10.47 percent. The 1.49 percentage-point difference between the two is known as "volatility drag." The drag is larger the more volatile the asset. Table 2 illustrates this concept.

The first line of the table shows these data for the S&P 500 total-return index over the past 45 years. Annual volatility was 17.42 percentage points. Now imagine an asset that has 50 percent more volatility than the S&P but exactly the same simple mean return. This is indicated in the second line of the table. The compound rate of return is less than for the S&P, and volatility drag in the last column is increased to 3.71 percentage points. An asset with double the volatility of the S&P but an equal simple mean return has the statistics shown in the third line, including an enormous volatility drag of 8.03 percentage points.

Symmetrically, volatility drag is reduced and compound return is enhanced when we look at assets with lower volatility. The last three lines of the table show that assets with the same simple mean return as the S&P but lower volatilities offer higher compound returns.

This phenomenon is what creates the enhancement in return from including gold in a stock portfolio in Figure Two. A mix of 80 percent equities and 20 percent gold has substantially lower volatility than either equities or gold, and therefore less volatility drag. The reduction in volatility drag is sufficient to produce a compound return that is higher than either equities or gold.

Mixes of stocks with proxies for physical gold, or with other primary assets. The gold-price data used in this report are for the physical commodity. Gold futures or exchange-traded funds would produce similar correlations. That's because under normal conditions the price of these gold proxies closely track the physical price. But the very purpose of including gold in a stock portfolio is protection of principal. In highly adverse economic conditions it might be a different story. *In extremis* proxies are liable to fail if there

Table 2

An Illustration of Volatility Drag: Forty-five Years of Returns from the S&P 500

from the end of 1969

volatility adjusted by (%)	*simple mean annual return (percent)*	*annual volatility (% pts)*	*compound rate of return (percent)*	*volatility drag (% pts)*
0	11.73	17.11	10.30	1.43
50	11.73	25.66	8.17	3.56
100	11.73	34.22	4.05	7.68
–25	11.73	12.83	10.95	0.78
–50	11.73	8.55	11.39	0.34
–75	11.73	4.28	11.65	0.08

Figure Three

Annual Return and Volatility for Mixes of the S&P and T-bonds

calendar-year average data since the end of 1969

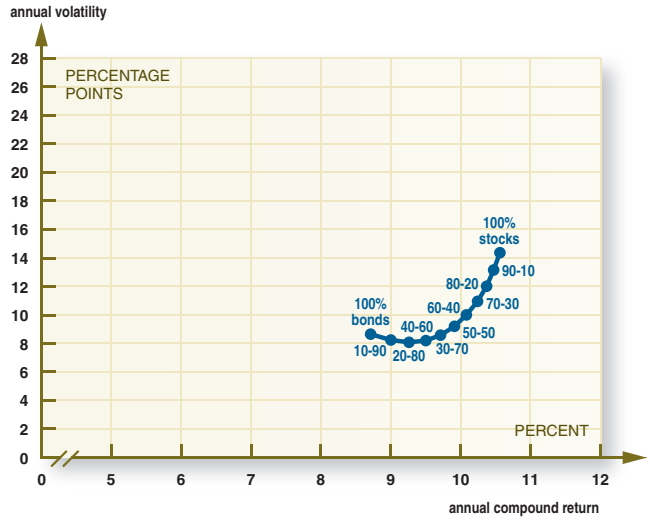
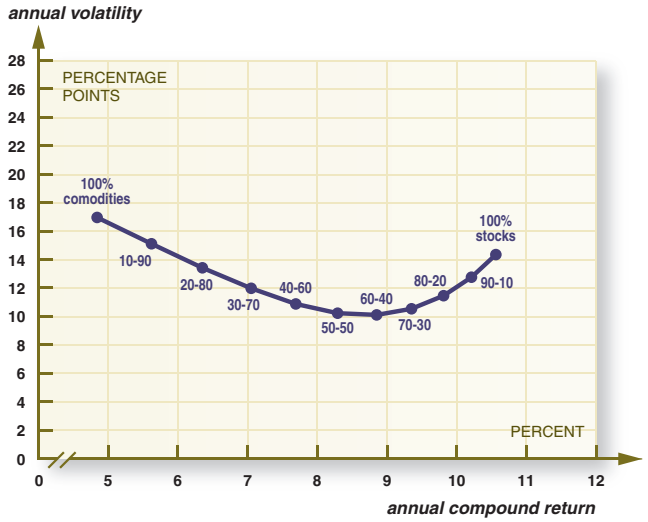


Figure Four

Annual Return and Volatility for Mixes of the S&P and Commodities

calendar-year average data since the end of 1969



Data: Calendar-year averages of month-end total-return indices of the S&P 500 and long Treasury bonds (University of Chicago/Dimensional Fund Advisors), spot prices for gold (*Metals Weeek*) and a diversified price index for four equally weighted commodity groups: crude oil, industrial metals, foodstuffs and textiles (Reuters Bridge Commodity Research Bureau/HCWE Inc.).

is no adequate substitute for the physical metal.[4]

The spectacular reduction in volatility that gold can achieve in a stocks portfolio is not available when other countervailing assets are used instead. Over one-year time frames the correlations between stocks and bonds and between stocks and commodities are not so deeply or consistently inverse. Figures Three and Four show the trade off between annual volatility and return for each of these two asset mixes. To achieve lower volatility requires a substantial sacrifice of return.

Investment conclusions. Of all the numerous methods that institutional investors use to reduce the volatility of risky portfolios, few are more powerful than the simple admixture of countervailing assets — mainly assets that behave oppositely to the principal asset in the mix and whose performance is therefore inversely correlated with it.

This is especially true of US stock portfolios, where the most inversely correlated countervailing asset is not bonds, but gold bullion. Using the S&P 500 as a proxy for US equity funds in general, we find that annual volatility would have been cut by 20 percent over the past 45 years by using an 80-20 mix of stocks and gold in place of a pure stock portfolio. Downside volatility (the left half of the frequency distribution of returns) would have been cut by one third. Thanks to the elimination of volatility drag, no sacrifice of annual compound return would have been necessary.

HCWE Inc.
R. David Ranson
d.ranson@hcwe.com

4. See "Who 'owns' the bullion in a precious-metal ETF?" *Strategic Asset Selector*, HCWE & Co. February 27, 2010.

Rev.: 022417-1050-9-bgm-8 STOCKMIX STOCKMIX 1970 2014