



# THE CASE FOR GOLD:

## PORTFOLIO BENEFITS OF THE ULTIMATE CURRENCY

### Introduction

In our previous white paper on gold,<sup>1</sup> we discussed two key reasons investors typically cite as critical decision-making factors supporting an investment in gold: as a form of **protection against inflation** and as a **safe haven investment**. We showed that current dynamics may support these investment theses over the foreseeable future:

- Expectations for future inflation have become elevated, and may remain so, given a backdrop of easy monetary policies the world over.
- Continued leverage throughout the economy is contributing to uncertainty over the future trajectory of the global economy and likely to result in ongoing heightened levels of volatility.

We believe these dynamics are likely to support ongoing strength in the price of gold over the foreseeable future and consider these to be important considerations in light of the current global economy. We would also propose that an equally important and complementary reason for an allocation to gold is its potential **portfolio**

*“Historically, adding a gold allocation has provided substantial enhancements to a portfolio’s risk-return profile.”*

**diversification benefit.** Indeed, we show that historically, adding a gold allocation provided substantial enhancements to a portfolio’s risk-return profile.

This white paper focuses on the portfolio applications of gold: we analyze the benefits of adding gold to an investment portfolio. Our findings show that the addition of gold into an investment portfolio may significantly improve the overall risk-adjusted performance. Notably, gold may help to minimize downside deviations in the value of an overall portfolio, reduce overall volatility, and enhance returns. For example, in 2008, when the U.S. stock market plummeted 37.0%,<sup>2</sup> gold actually appreciated in value during the year, returning 5.8%.<sup>3</sup> Additionally, we show that low levels of correlation in movements in the price of gold relative to other asset classes is a primary factor in potentially enhancing

overall portfolio performance and a key reason to consider the addition of a gold allocation. Specifically, we find that incorporating a gold allocation into an investment portfolio produces optimal results based upon efficient frontier analysis.

### Superior Performance of Gold

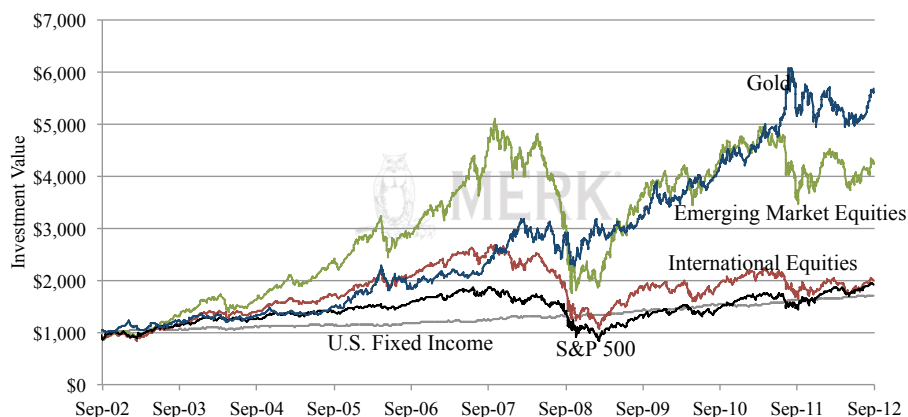
Over recent years, gold has performed remarkably well relative to other asset classes, in terms of both absolute performance and risk-adjusted performance. Over the preceding 10 years, an investment in gold would have significantly outperformed a corresponding investment in the S&P 500 Index or U.S. bonds, not to mention international and emerging market equities. Figure 1 illustrates that over the past 10 years, gold outperformed U.S. equities by over three times.

*“Gold may help to minimize downside deviations in the value of an overall portfolio, reduce overall volatility, and enhance returns.”*

<sup>1</sup> Please see Merk Investments’ White Paper: [“Case for Gold: Invest in the Ultimate Currency?”](#)

<sup>2</sup> As measured by the S&P 500 Total Return Index

<sup>3</sup> As measured by the spot price of gold per Troy ounce

**Figure 1: Growth of \$1,000 for Various Asset Classes over 10-Year Period**

Source: Merk Investments, Bloomberg

All calculations based on daily data from 9/30/2002 - 9/30/2012

Indices used: Gold: Spot Gold Price, S&amp;P 500: S&amp;P 500 Total Return Index, International Equities: MSCI EAFE Total Return Net of Tax Index USD, Emerging Market Equities: MSCI Emerging Markets Total Return Net of Tax Index USD, U.S. Fixed Income: Barclays US Aggregate Total Return Value Unhedged USD

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*“Since the onset of the crisis, gold has exhibited lower levels of volatility compared to domestic and international equity markets.”*

As is depicted in the Figure 1, gold has generated consistently positive returns over this 10-year period. The gold returns and their volatility were favorable compared to other asset classes, especially relative to equity indices, which displayed more sporadic and volatile returns. In fact, on a year-by-year basis, gold has performed very well; outperforming U.S. fixed income over every year analyzed, and frequently in the top tier of asset class returns. See Figure 2.

*“Gold outperformed U.S. equities by over three times over the past 10 years.”*

Impressively, and hand-in-hand with its consistent level of performance, gold has exhibited lower levels of volatility relative to the S&P 500 Index and international and emerging market equities, despite a period of unprecedented market volatility, as measured by annualized standard

deviation of returns. Figure 3 outlines the annualized standard deviation of returns for gold along with international and domestic equities, through June 30, 2012, over a variety of different time horizons. Notably, since the onset of the financial crisis, gold has exhibited lower levels of volatility relative to domestic and international equity markets, supporting the notion that it may act as a safe haven during times of crisis.

**Figure 2: Annual Returns of Select Asset Classes**

| 2002                                 | 2003                                 | 2004                                 | 2005                                 | 2006                                | 2007                                 | 2008                                | 2009                                | 2010                                | 2011                                 |
|--------------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|-------------------------------------|--------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|--------------------------------------|
| <b>GOLD</b><br>24.77%                | Emerging Market Equities<br>55.82%   | Emerging Market Equities<br>25.55%   | Emerging Market Equities<br>34.00%   | Emerging Market Equities<br>32.14%  | Emerging Market Equities<br>39.42%   | International Fixed Income<br>7.46% | Emerging Market Equities<br>78.51%  | <b>GOLD</b><br>29.52%               | <b>GOLD</b><br>10.06%                |
| International Fixed Income<br>24.11% | International Equities<br>38.59%     | International Equities<br>20.25%     | <b>GOLD</b><br>17.92%                | International Equities<br>26.34%    | <b>GOLD</b><br>30.98%                | <b>GOLD</b><br>5.77%                | International Equities<br>31.78%    | Emerging Market Equities<br>18.88%  | U.S. Fixed Income<br>7.84%           |
| U.S. Fixed Income<br>10.25%          | S&P 500<br>28.68%                    | International Fixed Income<br>13.31% | International Equities<br>13.54%     | <b>GOLD</b><br>23.15%               | International Fixed Income<br>12.11% | U.S. Fixed Income<br>5.24%          | S&P 500<br>26.46%                   | S&P 500<br>15.06%                   | S&P 500<br>2.11%                     |
| Emerging Market Equities<br>-6.17%   | International Fixed Income<br>20.73% | S&P 500<br>10.88%                    | S&P 500<br>4.91%                     | S&P 500<br>15.79%                   | International Equities<br>11.17%     | S&P 500<br>-37.00%                  | <b>GOLD</b><br>24.36%               | International Equities<br>7.75%     | International Fixed Income<br>-0.06% |
| International Equities<br>-15.94%    | <b>GOLD</b><br>19.37%                | <b>GOLD</b><br>5.54%                 | U.S. Fixed Income<br>2.43%           | International Fixed Income<br>8.10% | U.S. Fixed Income<br>6.97%           | International Equities<br>-43.38%   | International Fixed Income<br>6.40% | U.S. Fixed Income<br>6.54%          | International Equities<br>-12.14%    |
| S&P 500<br>-22.10%                   | U.S. Fixed Income<br>4.10%           | U.S. Fixed Income<br>4.34%           | International Fixed Income<br>-8.54% | U.S. Fixed Income<br>4.33%          | S&P 500<br>5.49%                     | Emerging Market Equities<br>-53.33% | U.S. Fixed Income<br>5.93%          | International Fixed Income<br>1.86% | Emerging Market Equities<br>-18.42%  |

Source: Merk Investments, Bloomberg

Indices used: Gold: Spot Gold Price, S&amp;P 500: S&amp;P 500 Total Return Index, International Fixed Income: S&amp;P/Citigroup International Treasury Bond Ex-US Index, International Equities: MSCI EAFE Total Return Net of Tax Index USD, Emerging Market Equities: MSCI Emerging Markets Total Return Net of Tax Index USD, U.S. Fixed Income: Barclays US Aggregate Total Return Value Unhedged USD

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On a risk-adjusted basis, gold has produced superior returns, as measured by the Sharpe ratio.<sup>4</sup> Over the 10-year period ended September 30, 2012, gold's performance generated a Sharpe ratio of 0.85. In comparison, the S&P 500 Index generated a Sharpe ratio of just 0.30, as did international equities. Gold's Sharpe ratio was nearly as high over the five year period, as it was over the 10-year period ended September 30, 2012, while comparable equity indices produced negative Sharpe ratios.<sup>5</sup> In fact, over each time period analyzed, gold outperformed domestic and international equities on a risk-adjusted basis. See Figure 4.

*"In the past 10 years, gold has outperformed equities on a risk-adjusted basis."*

**Figure 3: Annual Volatility: Gold vs. Equities**

| 2008                               | 2009                               | 2010                               | 2011                               | 3 Year                             | 5 Year                             | 10 Year                            |
|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|------------------------------------|
| S&P 500<br>41.05%                  | S&P 500<br>27.43%                  | International Equities<br>19.17%   | International Equities<br>23.62%   | International Equities<br>20.32%   | Emerging Market Equities<br>26.73% | Emerging Market Equities<br>21.97% |
| Emerging Market Equities<br>40.82% | Emerging Market Equities<br>26.73% | Emerging Market Equities<br>18.11% | S&P 500<br>23.33%                  | Emerging Market Equities<br>19.25% | S&P 500<br>26.59%                  | S&P 500<br>21.21%                  |
| International Equities<br>36.44%   | International Equities<br>24.94%   | S&P 500<br>18.06%                  | Emerging Market Equities<br>22.36% | S&P 500<br>18.82%                  | International Equities<br>25.18%   | International Equities<br>20.29%   |
| <b>GOLD</b><br><b>31.78%</b>       | <b>GOLD</b><br><b>20.37%</b>       | <b>GOLD</b><br><b>16.28%</b>       | <b>GOLD</b><br><b>20.24%</b>       | <b>GOLD</b><br><b>17.90%</b>       | <b>GOLD</b><br><b>21.97%</b>       | <b>GOLD</b><br><b>19.78%</b>       |

Source: Merk Investments, Bloomberg

Volatility is measured as annual standard deviation of returns

Indices used: Gold: Spot Gold Price, S&P 500: S&P 500 Total Return Index, International Equities: MSCI EAFE

Total Return Net of Tax Index USD, Emerging Market Equities: MSCI Emerging Markets Total Return Net of Tax

Index USD 3-yr, 5-yr, 10-yr data for the period ended 9/30/2012.

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**Figure 4: Sharpe Ratios - Gold vs. Equities**

|                          | 3- Year     | 5-Year      | 10-Year     |
|--------------------------|-------------|-------------|-------------|
| S&P 500                  | 0.70        | 0.02        | 0.30        |
| International Equities   | 0.10        | -0.23       | 0.32        |
| Emerging Market Equities | 0.29        | -0.07       | 0.70        |
| <b>Gold</b>              | <b>1.15</b> | <b>0.83</b> | <b>0.85</b> |

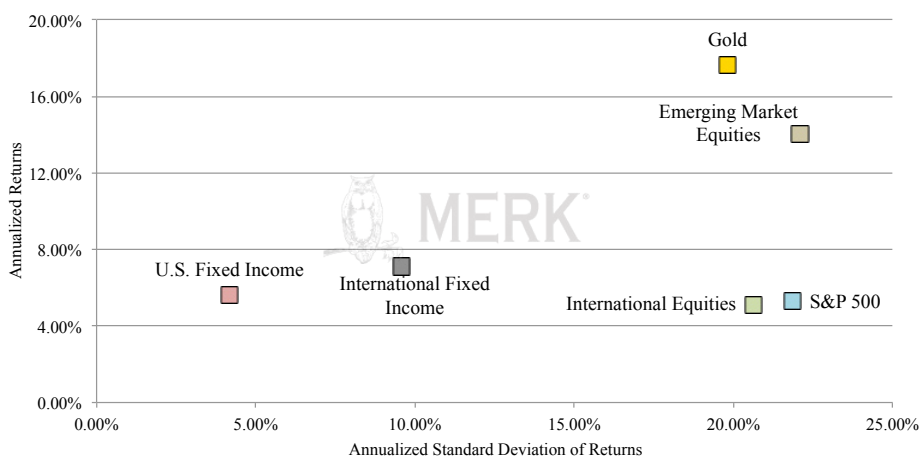
Source: Merk Investments, Bloomberg

All calculations for the period ended 9/30/2012

Indices used: International Equities: MSCI EAFE Total Return Index USD, Emerging Market Equities: MSCI

Emerging Markets Total Return Index USD

**Figure 5: 10-Year Risk-Return Profiles for Various Asset Classes**



Source: Merk Investments, Bloomberg

All calculations for the period ended 9/30/2012

Indices used: Gold: Spot Gold Price, S&P 500: S&P 500 Total Return Index, International Equities: MSCI

EAFE Total Return Net of Tax Index USD, Emerging Market Equities: MSCI Emerging Markets Total

Return Net of Tax Index USD, International Fixed Income: S&P/Citigroup International Treasury Bond

Ex-US Index, U.S. Fixed Income: Barclays US Aggregate Total Return Value Unhedged USD

Indeed, the risk-return profile of gold over a 10-year period appears very favorable relative to other asset classes, as depicted in Figure 5.

### Portfolio Benefits of Gold

Given its historic risk-adjusted performance, it stands to reason that adding a gold component to an investment portfolio may help improve the overall risk-adjusted investment profile. For instance, through calendar year 2008, a portfolio comprised 100% of the S&P 500 Index would have lost 37.0% of its value. During the same year, gold performed much better, returning +5.8%. Adding just a 10% gold allocation to a portfolio otherwise comprising the S&P 500 Index

<sup>4</sup> The Sharpe ratio is a measure of the excess return per unit of risk in an investment asset or a trading strategy.

<sup>5</sup> A negative Sharpe ratio infers that an investment underperformed the risk free rate of return over the time period analyzed. In this example, the return on a generic three month U.S. Treasury Bill Index was used for the risk free rate of return.

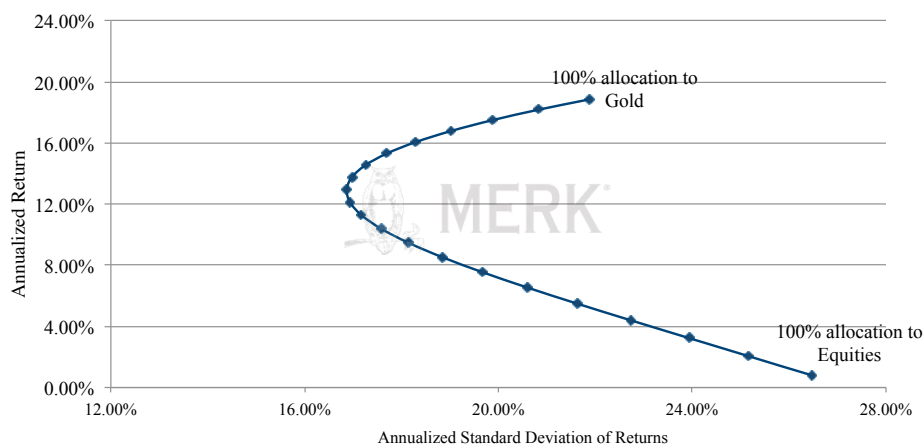


would have reduced a 37.0% loss by nearly 5% in 2008, to -32.7%.<sup>6</sup> Not only would the addition of gold have helped to improve the absolute performance of such a portfolio, but as we will demonstrate below, the risk profile would also have been improved. **This should not suggest gold is a risk-free investment.** As a reminder, after soaring from \$35 an ounce in the early 1970s to \$850 in January 1980, gold fell 65% within a couple of years to \$296.75 an ounce in June 1982. So even as we look back as far as 20 years in the analysis below, gold may have periods of extra-ordinary performance, both on the upside and on the downside.

*“Gold may provide uncorrelated returns while other asset classes are moving in tandem.”*

The results were quite remarkable. As Figure 6 depicts, a portfolio comprised 100% gold (top right end of efficient frontier) would have returned 18.9% on an annualized basis, with a standard deviation of returns of 21.9%. In comparison, the S&P 500 returned a much lower 0.8% annualized, but a higher standard deviation of returns of 26.5% (lower right end of efficient frontier). Each point along the efficient frontier depicted above represents a 5.0% incremental change in the make-up of a hypothetical portfolio comprised of the S&P 500 and gold.<sup>7</sup> Despite the S&P 500 significantly underperforming gold, the efficient frontier depicts an

**Figure 6: Efficient Frontier including Gold  
5 years through September 30, 2012**



Source: Merk Investments, Bloomberg

All calculations based on daily data from 9/30/07 to 9/30/12

Gold: Spot Gold Price, Equities: S&P 500 Total Return Index

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optimal risky portfolio having a blend of the two assets. In other words, a portfolio comprised of both the S&P 500 and gold would produce superior risk-adjusted returns when combined with a risk free asset compared to a portfolio made up solely of gold, or solely the S&P 500, for the five-year period ended September 30, 2012.

The improvements in the efficient frontier by adding a gold component are due to two factors: the superior risk-adjusted returns produced by gold itself, and the low level of correlation between gold and the S&P 500 over time. It is this low level of correlation that is important in understanding why a blend of the two assets is superior to one asset alone. When asset classes exhibit low levels of correlation to one another, it is less likely that they will move in tandem. The example of 2008, given above, is evidence that holding low correlated assets may help protect against downside

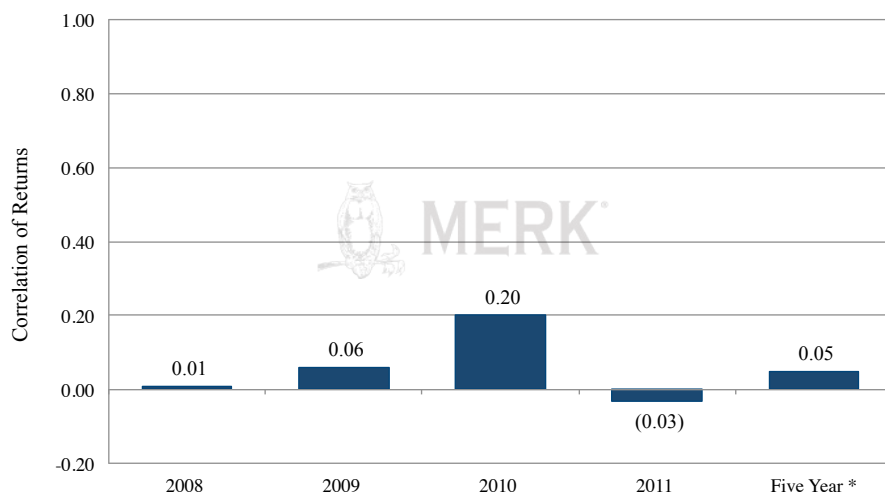
movements in the value of an investment portfolio. Adding a gold component may reduce overall portfolio volatility. With monetary policy makers increasingly active in managing the economy, we have seen many correlations across asset classes approaching one. In such an environment, it is increasingly difficult for investors to find uncorrelated returns. Gold may fulfill this requirement (Figure 7).

<sup>6</sup> Assuming an investor bought and held those positions throughout the year. Based upon the performance of the S&P 500 Total Return Index and the price of gold per troy ounce, respectively.

<sup>7</sup> There are 21 separate portfolios comprised of gold and/or the S&P 500, each portfolio allocation totaling 100%.



**Figure 7: Correlation of Returns between Gold and the S&P 500 Index**



Source: Merk Investments, Bloomberg

\* Five year period ended 9/30/2012

All calculations based on daily data from 9/30/2007- 9/30/2012

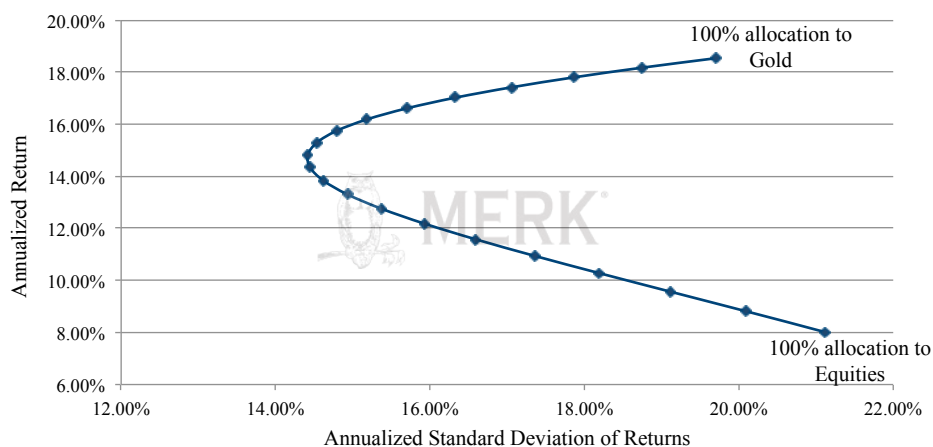
**“Gold has exhibited low levels of correlation of returns to the S&P 500.”**

Extending our efficient frontier analysis, we found similar results when analyzing the addition of gold to a portfolio comprised of the S&P 500 over 10-year (Figure 8) and 20-year (Figure 9) time horizons. In both cases, the optimal portfolio was a blend of the two asset classes.

### Gold Shines Even When Under-performing

Note that even during time periods when gold underperforms other asset classes, as it did during the 20-year time period analyzed in Figure 9, the addition of a gold component improves the overall risk-adjusted return profile of a risky portfolio. We consider this to be largely driven by the low levels of correlation between the two assets and thus the positive impact it has on the volatility profile of the hypothetical portfolio above. For example, we find that a portfolio comprised 50% gold and 50% the S&P 500 would have exhibited an annualized standard deviation of returns of 12.7% over the 20-year period ended September 30, 2012. This is a significant reduction to the annualized standard deviation of returns exhibited by a portfolio comprised 100% the S&P 500, which was 19.2% over the same timeframe.

**Figure 8: Efficient Frontier including Gold - 10 years through Sept. 30, 2012**



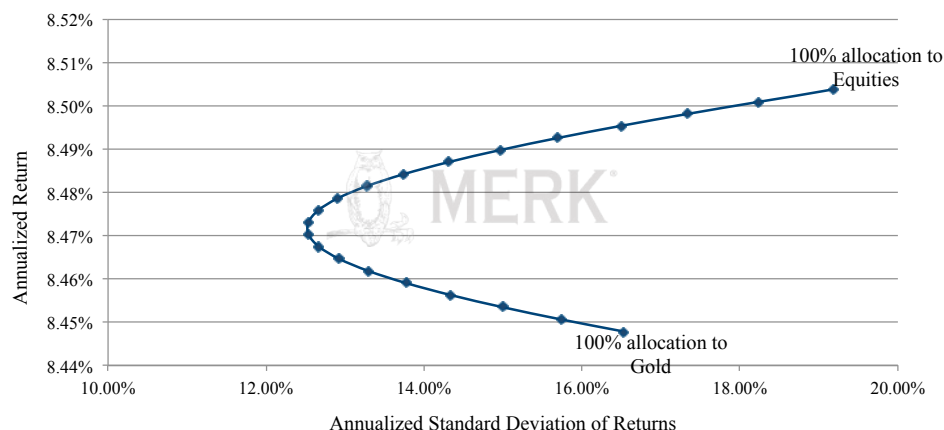
Source: Merk Investments, Bloomberg

All calculations based on daily data from 9/30/02 to 9/30/12

Gold: Spot Gold Price, Equities: S&P 500 Total Return Index

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**Figure 9: Efficient Frontier including Gold - 20 years through Sept. 30, 2012**



Source: Merk Investments, Bloomberg

All calculations based on daily data from 9/30/92 to 9/30/12

Gold: Spot Gold Price, Equities: S&P 500 Total Return Index

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### Gold Enhances Balanced Portfolios

In addition, we analyzed the impact of adding gold to a portfolio otherwise comprised of U.S. equities and fixed income (a 60%/40% mix, respectively). The results were very similar to the above analysis. We found the optimal portfolio composition over both a five-year and 10-year period was a mix of equities, fixed income *and gold*. Similar to its relationship to the S&P 500, gold exhibited very low levels of correlation of returns to the equity/fixed income index used in our analysis. For instance, over the five-year period ended September 30, 2012, we found the correlation of returns to be just 0.05. Such a small correlation is a key contributing factor in why gold may improve the risk-adjusted returns of these portfolios.

The following charts (Figure 10, Figure 11) clearly highlight how the addition of a gold component can potentially enhance the risk-adjusted return profile of an investment portfolio.

***“Adding a gold component may reduce overall portfolio volatility.”***

Through the above analysis, we have found that adding a gold component may create a more optimal investment portfolio composition. Specifically, gold's superior performance and low correlation to other asset classes may enhance the risk-adjusted returns of an overall investment portfolio.

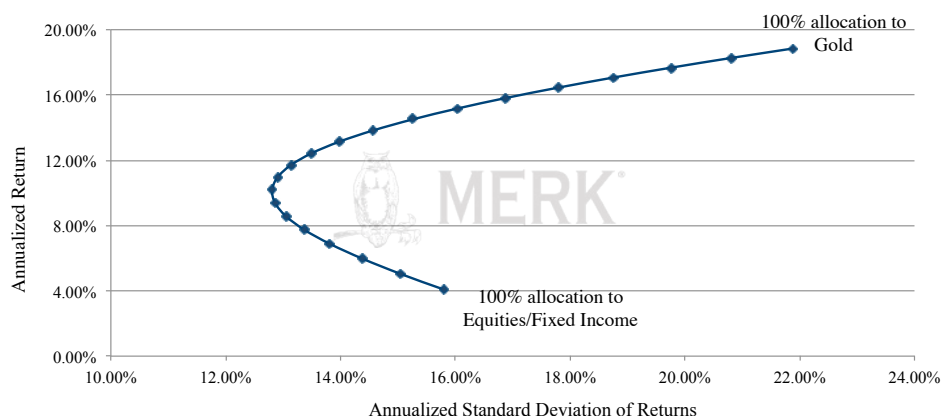
### Conclusion

As our analysis has shown, the portfolio benefits of an investment in gold are

compelling. Gold has shown attractive performance over a variety of different timeframes, while maintaining a more contained risk profile relative to other asset classes. As evidenced by using an efficient frontier analysis, we demonstrated that the addition of gold may increase overall portfolio returns, while concurrently reducing the overall volatility of a portfolio. In particular, the low level of correlation in the price

of gold relative to other assets may generate superior portfolio diversification benefits. These attributes, unique to gold, are critical in increasing risk-adjusted performance, which we have shown to be higher in portfolios with an allocation to gold relative to those without. Overall, we consider our analysis supports the notion that investment portfolios may benefit from the addition of a gold allocation.

**Figure 10: Efficient Frontier including Currencies  
5 years through Sept. 30, 2012**



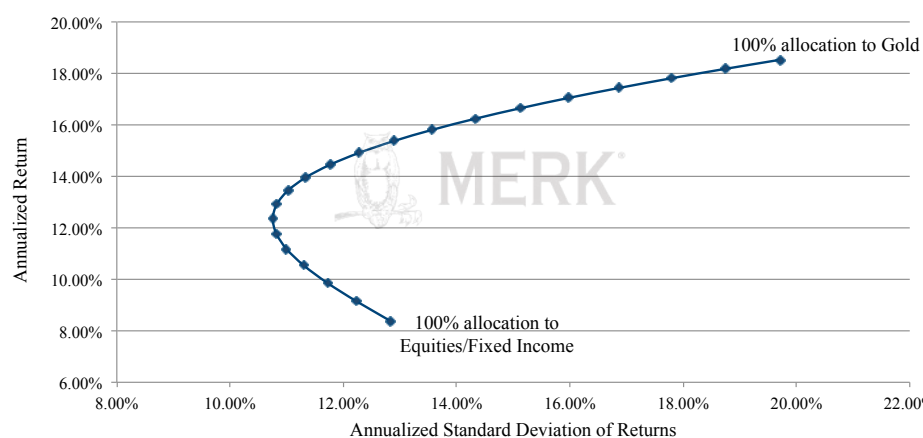
Source: Merk Investments, Bloomberg

All calculations based on daily data from 9/30/07 to 9/30/12

Gold: Spot Gold Price, Equities/Fixed Income: Dow Jones U.S. Moderate Index

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**Figure 11: Efficient Frontier including Currencies  
10 years through Sept. 30, 2012**



Source: Merk Investments, Bloomberg

All calculations based on daily data from 9/30/02 to 9/30/12

Gold: Spot Gold Price, Equities/Fixed Income: Dow Jones U.S. Moderate Index

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*To Learn about the potential portfolio benefits of adding gold and other hard currencies to your investment portfolio, please sign up to our newsletter, Merk Insights at [www.merkinvestments.com/newsletter](http://www.merkinvestments.com/newsletter)*

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**Axel Merk** is the President and CIO of Merk Investments, manager of the Merk Funds. An authority on gold and other hard currencies, he is a pioneer in the use of strategic currency investing to seek diversification. Axel Merk is a sought after speaker and author on topics ranging from the economy, gold and currencies to sustainable wealth and personal finance, as well as a regular guest and contributor to the business media around the world.



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