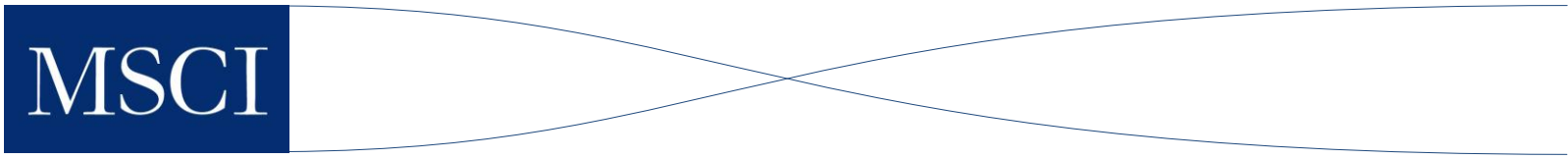

Achieving Commodities Exposure via Equities

MSCI ACWI Select Commodity Producers Indices

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Introduction

Commodities have become a popular investment vehicle over the last decade for their strong performance and diversification benefits. Accessing commodities through equities that have exposure to commodities has become increasingly prevalent as it may circumvent many of the challenges associated with direct physical investing or derivatives, including cost, storage, access, and taxes. The MSCI Select Commodity Producers Indices were developed to reflect equities which have strong relationships to commodities. The returns to the companies in the MSCI Select Commodity Producers Indices are highly correlated with commodities and may allow investors tracking these indices to gain exposure to commodities. In addition to the added transparency and accessibility from using equities rather than commodities, this approach also allows investors the potential for equity dividend income, while reaping the general benefits of commodities investing.

Why Get Exposure to Commodities through Equities?

Commodities have become a popular investment vehicle over the last decade for their strong performance and diversification benefits. As real assets, unlike stocks and bonds, they have reacted differently to changing economic conditions, performing well, for instance, in periods of rising inflation. Additionally, in recent years commodities prices have outperformed stocks and bonds due to increasing demand from developing countries such as China and India. Finally, they have had historically low to negative correlations with bonds and equities, providing diversification to traditional stock and bond portfolios. This has been particularly evident (most notably with gold) during times of crisis such as wars and stock market crashes. Appendix 2 discusses these points in greater detail.[1]

While buying the physical assets represents the purest exposure to commodities, there are many ways to invest in commodities either directly or through various investment vehicles. Exhibit 1A summarizes the main ways: (1) Direct physical investment; (2) Commodity futures; and (3) Commodity-related stocks. The first way, direct physical investment, means buying the actual commodity, be it gold, oil, wheat, cotton, etc. While holding and storing small amounts of commodities such as gold may be practical, the costs of storing most physical commodities for investment purposes is prohibitive.

[1] For further information on commodities investing, see Idzorek (2006) for a discussion on commodities as an asset class and Fabozzi, Fuss, and Kaiser (2008) for a comprehensive treatment of the topic.

Exhibit 1A: Primary Methods for Accessing Commodities – Direct Investments

Primary Methods	Benefits	Shortcomings
Direct Physical Investment	• **Purest form of exposure** • **Diversification benefits, inflation hedge**	• **High storage costs and insurance costs (convenience yield)** • **Potentially high transaction costs**
Commodity Futures	• **Exposure without holding physical (no storage or insurance costs)** • **Diversification benefits, inflation hedge**	• **Roll risk (possible contango)** • **Frequent transactions**
Commodity-related Stocks	• **Exposure without holding physical or rolling futures** • **Diversification benefits, inflation hedge** • **Dividend yield**	• **May be subject to equity beta and valuations** • **Producers may hedge commodities exposure**

Futures contracts on commodities are a second way to invest in the asset class. Futures contracts allow investors to profit on increases (or decreases) in the prices of various commodities without having to buy the physical commodity itself. However, for many individual investors, investing in futures and other derivatives remains relatively limited due to the complexities of these instruments. These contracts can also be risky due to contango and backwardation, market situations specific to futures which can potentially lead to losses that do not reflect changes in underlying spot commodity prices.[2]

The third option in Exhibit 1A is to invest in the stocks of companies that are commodities producers or companies that have a strong relationship to commodities. While the exposure to commodities is less direct, this option has several advantages. Not only are direct physical investment and derivatives unnecessary, but equities with exposure to commodities can provide exposure to equity-like total returns and benefit from long-run equity growth (e.g., dividend

[2] Contango occurs when the price of a futures contract is trading above the expected spot price at contract maturity. The normal course of a futures contract in a market in contango is to decline in price, so that an investor going long the commodity buys the contract at a higher price than the roll price (when he or she later closes it out) and the money raised from the closed out contract is not enough to buy a new contract going forward. The opposite of contango is backwardation (or normal backwardation) which occurs when the price of a futures contract is trading below the expected spot price at contract maturity. Backwardation can earn extra profits for investors, often called a "convenience yield." Note this very seldom arises with gold or silver.

income and capital appreciation). At the same time, investors can also obtain the general benefits of commodities investing.

In practice, commodity exchange-traded products (ETPs) are generally-used wrappers for the aforementioned investment methods. While an ETP may simplify or reduce some of the shortcomings of each investment method, some cannot be avoided; the structure employed by each ETP determines in large part the degree to which they are exposed to the characteristics of each vehicle. In the US, for instance, commodity ETPs are limited to physical-backed exchange-traded funds (ETFs), derivative-based commodity ETFs, and commodity exchange-traded notes (ETNs) as shown in Exhibit 1B.

Exhibit 1B: Types of Commodity Investment Vehicles in the US

Type	Characteristics	Investment Considerations
Physical-backed ETCs	• **Underlying investments are physical commodities**	• **No income distributions** • **Non-standard tax treatment (taxed as collectible investments)**
Derivative-based ETFs	• **Exposure to broad-based commodity index or single commodity index through futures contracts, swaps or other derivatives** • **Index methodology may be rules-based, actively selected, or combination of both**	• **Roll risk** • **Counterparty risk (if other than futures)** • **No income distributions**
Commodity Equity ETFs	• **Exposure to commodity producer equities through sector-driven index classification or additional screenings of production criteria**	• **May be subject to equity beta and valuations** • **Producers may hedge commodities exposure**
Commodity ETNs	• **Exposure to broad-based, sector, or single commodities**	• **Subject to credit risk and credit ratings of issuer; no principal protection** • **No income distributions**

MSCI Select Commodity Producers Indices

MSCI developed the MSCI Select Commodity Producers Indices to capture equities which have strong relationships to commodities. The underlying universe for all the MSCI Select Commodity Producers Indices is MSCI ACWI IMI, a global equity index consisting of developed and emerging market countries across the large, mid and small cap size segments. The returns to the companies in the MSCI Select Commodity Producers Indices are highly correlated with commodities and allow investors tracking the indices to gain exposure to commodities with the potential benefits of an equity implementation as described in the previous section. There are five indices which aim to capture the performance of companies that are primarily involved in the production of different types of commodities:

- **Energy:** MSCI ACWI Select Energy Producers Investable Market Index (IMI)
- **Agriculture:** MSCI ACWI Select Agriculture Producers Investable Market Index (IMI)
- **Gold:** MSCI ACWI Select Gold Miners Investable Market Index (IMI)
- **Silver:** MSCI ACWI Select Silver Miners Investable Market Index (IMI)
- **Other Metals and Mining:** MSCI ACWI Select Metals & Mining Producers Ex Gold and Silver Investable Market Index (IMI)

All five MSCI Select Commodity Producers Indices are constructed by applying a set of screening criteria to identify the companies to be included. The screening criteria focus on the types of business activity that the firm is engaged in and its primary sources of revenue. Ideally, the majority of a constituent's revenues come from business activity that is tied to the production of the commodity. The indices are free float-adjusted market capitalization weighted. In addition, 25/50 capping constraints[3] are applied to MSCI ACWI Select Silver Miners IMI and MSCI ACWI Select Gold Miners IMI in order to ensure diversification.

The historical performance of each MSCI Select Commodity Index is shown in Exhibit 2, along with its correlation to the related BofA Merrill Lynch Commodity Index.[4] The excess return versions of the BofA Merrill Lynch Indices are used.

[3] The indices are constructed in such a way that no more than 25% of the index may be invested in a single company. Furthermore, the sum of the weights of all companies with more than 5% weight in the index does not exceed 50%.

[4] The BofA Merrill Lynch Commodity Index (MLCX) is presented in three formats: a Spot Return index (MLCX SP) that tracks the price movements of the underlying commodity futures, an Excess Return index (MLCX ER) that factors in both price movements as well as roll yields, and a Total Return index (MLCX TR) that includes commodity price movements, a roll return component, and a T-bill return component to measure a fully collateralized commodity futures investment. See "The MLCX Handbook" (July 2011) for more detail on the index. Source: BofA Merrill Lynch Global Research, used with permission.

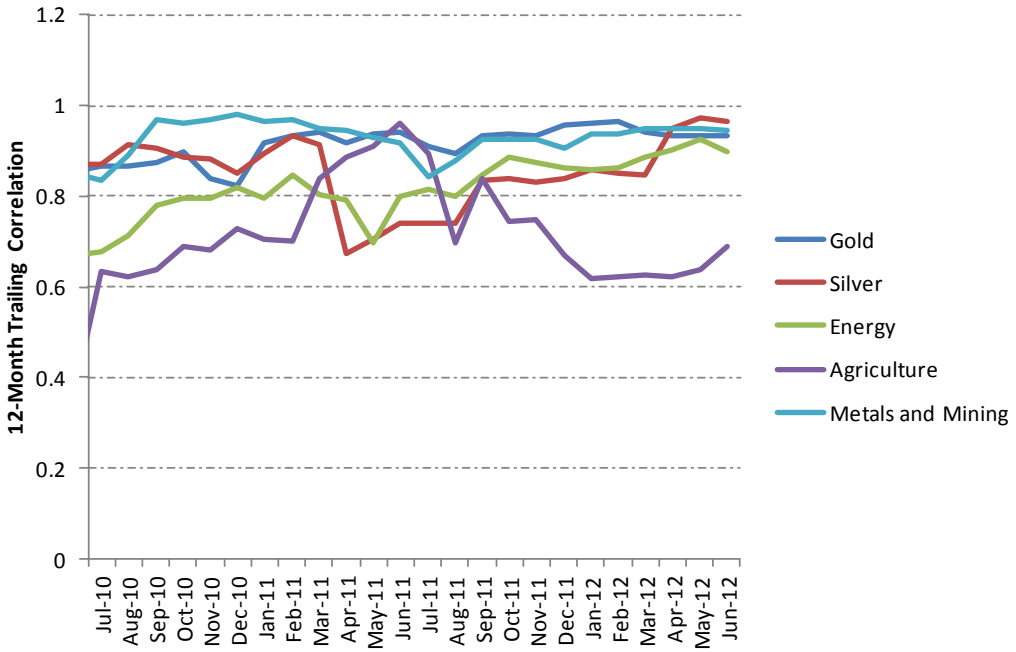
Exhibit 2: Performance Summary of MSCI Select Commodity Producer Indices (June 2009 to June 2012)

Energy	MSCI ACWI Select Energy Producers IMI	ML Energy Index
Annualized Return	7.1%	0.2%
Annualized Volatility	22.5%	22.3%
Correlation		0.81
Agriculture	**MSCI ACWI Select Agriculture Producers IMI**	**ML Agriculture Index**
Annualized Return	12.8%	7.5%
Annualized Volatility	23.9%	23.6%
Correlation		0.69
Gold	**MSCI ACWI Select Gold Miners IMI**	**ML Gold Index**
Annualized Return	7.7%	19.1%
Annualized Volatility	28.8%	20.1%
Correlation		0.88
Silver	**MSCI ACWI Select Silver Miners IMI**	**ML Silver Index**
Annualized Return	23.4%	25.6%
Annualized Volatility	40.6%	41.3%
Correlation		0.83
Metals & Mining	**MSCI ACWI Select Metals & Mining Producers ex Gold & Silver IMI**	**ML Industrial Metals Index**
Annualized Return	4.3%	8.0%
Annualized Volatility	33.3%	25.6%
Correlation		0.91

Sources: MSCI, BofA Merrill Lynch Global Research, used with permission.

The correlations with the BofA Merrill Lynch indices are very high on average; the lowest value is for Agriculture (0.69) and the highest value is for Metals & Mining ex Gold & Silver (0.91). We supplement these with rolling 12 month correlations over time in Exhibit 3, highlighting the relative stability of the correlations over time.

Exhibit 3: Correlations Over Time for MSCI Select Commodity Producers Indices with BofA Merrill Lynch Commodities Indices (June 2010 to June 2012)



	Gold	Silver	Energy	Agriculture	Metals and Mining
Average 12-Month Correlation	**0.91**	**0.85**	**0.82**	**0.71**	**0.93**
Minimum 12-Month Correlation	**0.82**	**0.67**	**0.67**	**0.37**	**0.84**
Maximum 12-Month Correlation	**0.96**	**0.97**	**0.93**	**0.96**	**0.98**

Shown are rolling correlations of MSCI ACWI Select Gold Miners IMI with the BofA Merrill Lynch Gold Index, MSCI ACWI Select Silver Miners IMI with the BofA Merrill Lynch Silver Index, MSCI ACWI Select Agriculture IMI with the BofA Merrill Lynch Agriculture Index, MSCI ACWI Select Energy IMI with the BofA Merrill Lynch Energy Index, and MSCI ACWI Select Metals & Mining ex Gold & Silver IMI with the BofA Merrill Lynch Industrial Metals Index. Excess return versions of the BofA Merrill Lynch Indices are used. Sources: MSCI, BofA Merrill Lynch Global Research, used with permission.

Case Study: MSCI ACWI Select Gold Miners IMI

Next we look more closely at one of the five Select Commodity Producers Indices, MSCI ACWI Select Gold IMI.[5] The first step is to identify a selection universe or list of candidate companies. We begin with all constituents of MSCI ACWI IMI classified under the GICS® sub-industries Gold (15104030) and Precious Metals & Minerals (15104040). Next we identify those companies that fulfill the following criteria:

- Companies that operate gold mines and do not hedge their exposure to gold prices are included
- Within the Precious Metals & Minerals sub-industry, only companies that generate at least 50% of their revenues from gold mining are included
- Companies which primarily invest in but do not operate gold mines are not included

In a second step, after the criteria are applied, if the number of constituents is less than 30, previously screened out securities are added back according to a pre-determined list of priorities, with the aim of selecting companies in ascending order of their hedging of gold price exposure. These priorities appear in the methodology guide, "MSCI Select Commodity Producers Indices" (December 2011).

As of June 1, 2012, MSCI ACWI Select Gold Miners IMI had 52 names. The top 10 largest companies in the index are shown in Exhibit 4. These companies exhibit the strongest ties to gold prices via their focus on gold mining and production.

Exhibit 4: Top 10 Stocks in MSCI ACWI Select Gold Miners IMI (June 1, 2012)

	Company Name	Country	GICS Sub Industry	Weight	Reason for Inclusion
1	Barrick Gold Corp.	Canada	Gold	17.08%	Greater than 50% revenues from gold and is unhedged
2	Goldcorp Inc.	Canada	Gold	12.41%	Greater than 50% revenues from gold and is unhedged
3	Newmont Mining	USA	Gold	9.19%	Greater than 50% revenues from gold and is unhedged
4	Newcrest Mining	Australia	Gold	6.34%	Greater than 50% revenues from gold and is unhedged
5	Yamana Gold	Canada	Gold	4.75%	Greater than 50% revenues from gold and is unhedged
6	Gold Fields	South Africa	Gold	4.50%	Greater than 50% revenues from gold and is unhedged
7	Anglogold Ashanti	South Africa	Gold	4.36%	Greater than 50% revenues from gold and is unhedged
8	Kinross Gold Corp.	Canada	Gold	4.27%	Greater than 50% revenues from gold and is unhedged
9	Eldorado Gold Corp.	Canada	Gold	3.84%	Greater than 50% revenues from gold and is unhedged
10	Buenaventura Minas ADR	Peru	Gold	3.77%	Greater than 50% revenues from gold and is unhedged
	Total Weight of Top 10 Names			70.51%	

Perhaps it is just as informative to look at the companies in the Gold and Precious Metals & Minerals sub-industries that do *not* actually make it into MSCI ACWI Select Gold Miners IMI. Exhibit 5 shows the largest 10 companies screened out and why they were screened out. Several well-known gold mining companies appear in the list including Royal Gold, Iamgold

[5] The index is weighted based on the MSCI 25/50 index methodology. For a description of the MSCI 25/50 index methodology, refer to http://www.msci.com/eqb/methodology/meth_docs/MSCI_25_50_Indices_Methodology_May11.pdf.

Corporation and New Gold. As noted in the table, these companies either hedge their exposure to gold prices, derive too little revenue from gold[6], or are not involved in the production of gold but are rather companies that invest in and develop gold mining properties.

Exhibit 5: Top 10 Companies Screened Out (Companies with Largest Market Free Float-Adjusted Market Capitalization in GICS Sub-Industries for Precious Metals & Minerals and Gold, June 1, 2012)

	Company Name	Country	GICS Sub Industry	Reason for exclusion
1	Silver Wheaton	Canada	Precious Metals & Minerals	Less than 50% revenues from Gold
2	Franco-Nevada Corp	Canada	Gold	Investment Company
3	Industrias Penoles CP	Mexico	Precious Metals & Minerals	Less than 50% revenues from Gold
4	Royal Gold	USA	Gold	Investment Company
5	Iamgold Corp	Canada	Gold	Gold prices hedged
6	New Gold	Canada	Gold	Gold prices hedged
7	Fresnillo Plc	UK	Precious Metals & Minerals	Less than 50% revenues from Gold
8	Pan American Silver Corp	Canada	Precious Metals & Minerals	Less than 50% revenues from Gold
9	Detour Gold	Canada	Gold	Less than 50% revenues from Gold
10	Alamos Gold	Canada	Gold	Gold prices hedged

Naturally, we expect that those companies that pass the various screening criteria will have a closer relationship with gold prices. To quantify this, we compare the correlations with gold prices of the returns of companies screened out versus those that are in the index.[7] Exhibits 6A and 6B show the correlations of monthly returns of the companies in Exhibits 4 and 5 with gold prices. The correlations with gold are on average higher for the companies in the MSCI ACWI Select Gold Miners IMI at 0.70 (market cap weighted across the companies shown) compared to the excluded companies at 0.61, conforming to the rationale behind this index. We also show the correlation with equities. The companies in this index have a lower market cap weighted average correlation (0.30) with respect to equities than those that are excluded (0.40), again supporting the investment thesis of greater diversification with respect to equities.

[6] Metals and mining companies generally have a gestation period before they start generating revenues. These companies have been included in the "less than 50% revenues from Gold" category.

[7] To identify companies screened out, we start with those companies that are in the Gold (GICS Industry 15104030) and Precious Metals & Minerals (GICS Industry 15104040) sub-industries. In the latter sub-industry, we consider those companies that mine gold but derive less than 50% revenues from gold. Finally, we identify the largest companies in the list according to their free float-adjusted market capitalization.

Exhibit 6A: Summary Statistics on the Largest 10 Companies in MSCI ACWI Select Gold Miners IMI (as of June 1, 2012)

	Company Name	Country	GICS Sub Industry	Monthly Return Correlation with Gold (June 2002* - June 2012)	Monthly Return Correlation with Equities (June 2002* - June 2012)
1	Barrick Gold Corp.	Canada	Gold	0.76	0.29
2	Goldcorp Inc.	Canada	Gold	0.73	0.28
3	Newmont Mining	USA	Gold	0.69	0.25
4	Newcrest Mining	Australia	Gold	0.64	0.45
5	Yamana Gold	Canada	Gold	0.72	0.33
6	Gold Fields	South Africa	Gold	0.66	0.29
7	Anglogold Ashanti	South Africa	Gold	0.59	0.29
8	Kinross Gold Corp.	Canada	Gold	0.67	0.24
9	Eldorado Gold Corp.	Canada	Gold	0.63	0.33
10	Buenaventura Minas ADR	Peru	Gold	0.66	0.34
	Market Cap Weighted Average			0.70	0.30

*Shown are monthly correlations of each company's stock returns with the returns to gold prices (represented by the London Gold PM Fixing) and equity returns (represented by MSCI ACWI IMI). The starting date for all companies is June 2002 with the exception of Yamana Gold (February 2004) and Eldorado Gold Corp (February 2003).

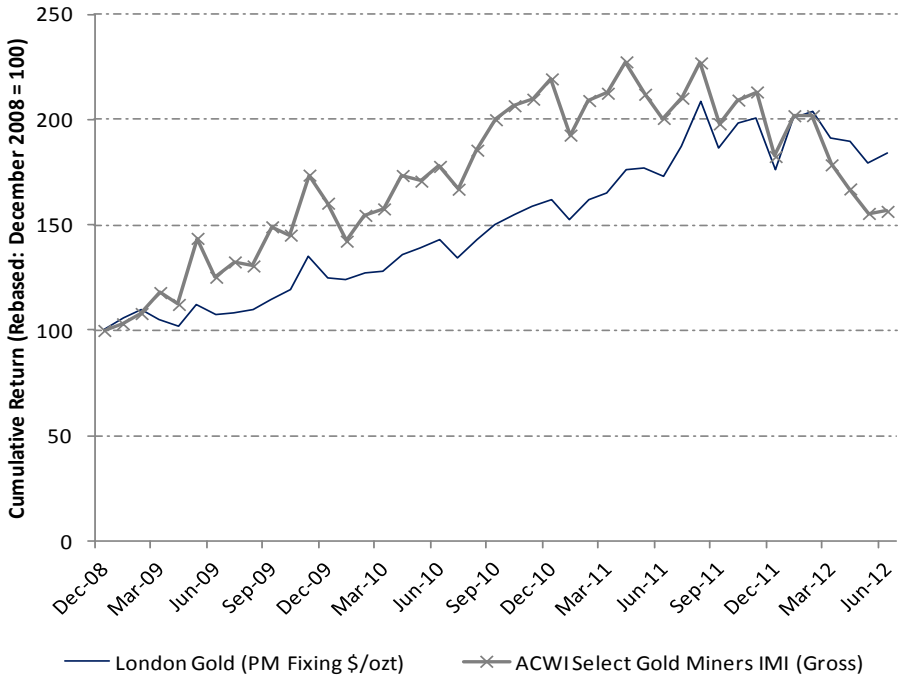
Exhibit 6B: Summary Statistics on Select Excluded Stocks (as of June 1, 2012)

	Company Name	Country	GICS Sub Industry	Monthly Return Correlation with Gold (June 2002* - June 2012)	Monthly Return Correlation with Equities (June 2002* - June 2012)
1	Silver Wheaton	Canada	Precious Metals & Minerals	0.61	0.52
2	Franco-Nevada Corp	Canada	Gold	0.67	0.34
3	Industrias Penoles CP	Mexico	Precious Metals & Minerals	0.45	0.48
4	Royal Gold	USA	Gold	0.62	0.16
5	Iamgold Corp	Canada	Gold	0.63	0.25
6	New Gold	Canada	Gold	0.61	0.36
7	Fresnillo Plc	UK	Precious Metals & Minerals	0.62	0.57
8	Pan American Silver Corp	Canada	Precious Metals & Minerals	0.64	0.46
9	Detour Gold	Canada	Gold	0.75	0.37
10	Alamos Gold	Canada	Gold	0.54	0.31
	Market Cap Weighted Average			0.61	0.40

*Shown are monthly correlations of each company's stock returns with the returns to gold prices (represented by the London Gold PM Fixing) and equity returns (represented by MSCI ACWI IMI). The starting date for all companies is June 2002 with the exception of the following: Silver Wheaton (August 2005), Franco-Nevada (January 2008), Iamgold (September 2003), New Gold (January 2005), Fresnillo (July 2008), Detour Gold (August 2007), and Alamos Gold (March 2003).

The final resulting index is shown in Exhibit 7, where we plot monthly cumulative returns for MSCI ACWI Select Gold Miners IMI against the London Gold PM Fixing. The index outperformed the benchmark gold price over most of the last 3.5 years shown. Only in the first half of 2012 has the MSCI ACWI Select Gold Miners IMI underperformed. The correlation between the two from January 2009 to June 2012 is 0.82, which is relatively high. It is, for instance, higher than the cap-weighted average of 0.68 for the top 10 companies in the index calculated over the same period.[8] For reference, the correlation between the returns of the MSCI ACWI IMI and the London Gold PM Fixing is only 0.12.

Exhibit 7: Performance of MSCI ACWI Select Gold Miners IMI (December 2008 to June 2012)



Annualized Returns	London Gold (PM Fixing $/oz)	MSCI ACWI Select Gold Miners IMI (Gross)
Whole Period	19.0%	13.7%
2009	25.0%	60.4%
2010	29.2%	36.8%
2011	8.9%	-16.8%
Jan to June 2012	9.0%	-26.5%

[8] In Exhibit 6A, we show a cap weighted average correlation with gold prices of 0.70 for the period June 2002-June 2012 given the available history for each company's stock. We recalculate this figure for just the period January 2009-June 2012 which is 0.68.

To get a sense of how much the return of MSCI ACWI Select Gold Miners IMI depends on gold prices, we run a simple regression of the index's returns on gold returns. As shown in Exhibit 8, the beta is 1.53, meaning that for every 1% change in gold prices, the index changes by 1.5%.[9] This relationship is statistically significant as seen by the t-statistic.[10] Moreover the adjusted R-square of 0.65 (the amount of variance explained[11]) is high when compared to typical stock return time series models. For comparison, MSCI ACWI IMI has an R-square of 0.03 when regressed against gold prices.

Exhibit 8: Regression of MSCI ACWI Select Gold Miners IMI on Gold Prices (January 2004 to June 2012, Monthly Returns)

	Estimate	t-statistic
Slope/Beta Coefficient	1.53	13.67
Adjusted R-square		0.65

Conclusion

As interest in commodities investing has grown, investors have looked for ways to avoid the well-known hurdles of commodities investing. Purchasing and storing the physical commodities themselves or using derivatives both entail certain implementation risks and costs. One alternative for accessing commodities is to invest in stocks whose returns have strong ties to the performance of commodities. These include commodities producers and miners, those who are involved in the direct production of the commodities. The MSCI ACWI Select Commodity Producers Indices provide exposure to these types of companies. Through exchange-traded products tracking these indices, it is now possible for investors to potentially gain exposure to commodities.

[9] The higher the sensitivity to gold, the higher the beta (also called the slope coefficient), which measures the percentage change in the index for each percentage change in gold prices.

[10] As a rule of thumb, a regression coefficient is statistically significant if it has a t-statistic above 2 or below -2. The t-statistic is the beta divided by the standard error of this beta estimate. The standard error essentially reflects how "robust" this beta is. If the standard error is very large relative to the estimate itself, the t-statistic will be low. Hence we are less confident about the preciseness of this relationship.

[11] The R-square measures how much the variation in index returns can be explained by variation in gold prices. The adjusted R-square is 0.65 here meaning that 65% of the variance in returns of the gold mining index can be explained by the variance of returns in gold prices.

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Appendix

Appendix 1: Analysis of Large Mining Companies not Included in the MSCI ACWI Select Gold Miners IMI

In this section, we take a closer look at some of the large mining companies not included in MSCI ACWI Select Gold Miners IMI. In particular, companies that have greater than 50% revenue from silver are instead included in MSCI ACWI Select Silver Miners IMI. Similarly, companies that do focus on other non-gold and non-silver metals such as platinum are included in MSCI ACWI Select Metal & Mining Producers ex Gold & Silver IMI. Finally, companies that focus on gold mining may not qualify for inclusion if they hedge gold prices or do not derive sufficient revenue from gold. The latter includes companies that are in their pre-revenue period.

A list of stocks that are not in the MSCI ACWI Select Silver Miners IMI are shown in Exhibit A1. Note that more than half of the mining companies are in the GICS sub-industry "Precious Metals & Minerals", which include companies that mine silver, platinum, and other non-gold metals. Silver Wheaton, Coeur d'Alene Mines, and Pan American Silver for instance are all silver producers (and logically are included in MSCI ACWI Select Silver Miners IMI). Exhibit A1 also shows the reason for exclusion for the companies.

Exhibit A1: A Sample of Companies Excluded from the MSCI ACWI Select Silver Miners IMI (as of June 1, 2012)

	Company Name	Country	GICS Sub Industry	Reason for exclusion
1	Silver Wheaton	Canada	Precious Metals & Minerals	Less than 50% revenues from Gold
2	Royal Gold	USA	Gold	Investment company
3	Iamgold Corp	Canada	Gold	Gold prices hedged
4	New Gold	Canada	Gold	Gold prices hedged
5	Coeur d'Alene Mines	USA	Precious Metals & Minerals	Less than 50% revenues from Gold
6	Hecla Mining	USA	Precious Metals & Minerals	Less than 50% revenues from Gold
7	Pan American Silver Corp	Canada	Precious Metals & Minerals	Less than 50% revenues from Gold

Exhibit A2 shows correlations between these names and gold prices (London Gold PM Fixing). Annualized returns are also shown. Exhibit A3 contrasts this data with the top seven holdings included in MSCI ACWI Select Gold Miners IMI.

Correlations with gold for those names in Exhibit A2 are lower on average than in Exhibit A3 (0.60 for the excluded names versus 0.70 for the top seven included names).

Also shown in these charts are the results of simple regressions of each stock's returns on gold prices. A regression captures the sensitivity of the stock's return to gold returns. The t-statistics and adjusted R-squares are substantially lower for the excluded names in Exhibit A2 compared to those in Exhibit A3. The average cap weighted t-statistic is 6.3 for the former compared to 9.6 for the latter. While both are high, the fact the latter is higher reflects stronger positive relationships with gold prices given that average betas are above 1. The adjusted R-squares for the stocks in Exhibit A2 are also much lower. In fact, only 33% of the variance in returns of these stocks can be explained by the variance in gold prices compared to a much higher 49% for the stocks in the index (Exhibit A3). These results imply that the relationship between stock prices and gold prices are stronger or more robust for the top seven names in the index compared to the seven excluded names.

Exhibit A2: Summary Statistics on Sample of Companies Excluded from the MSCI ACWI Select Silver Miners IMI (as of June 1, 2012)

	Company Name	Country	GICS Sub Industry	Annual Return (June 2002*-June2012)	Monthly Return Correlation with Gold (June 2002* - June 2012)	Monthly Return Correlation with Equities (June 2002* - June 2012)	Regression on Gold Prices (August 2005** - June 2012)		
							Beta	T-stat	Adj R-square
1	Silver Wheaton	Canada	Precious Metals & Minerals	36.1%	0.61	0.52	2.0	7.0	0.37
2	Royal Gold	USA	Gold	18.9%	0.62	0.16	1.3	7.0	0.37
3	Iamgold Corp	Canada	Gold	9.3%	0.63	0.25	1.7	7.9	0.43
4	New Gold	Canada	Gold	8.1%	0.61	0.36	1.9	6.8	0.36
5	Coeur d'Alene Mines	USA	Precious Metals & Minerals	-0.5%	0.51	0.48	1.6	6.1	0.30
6	Hecla Mining	USA	Precious Metals & Minerals	0.9%	0.48	0.52	1.5	4.6	0.20
7	Pan American Silver Corp	Canada	Precious Metals & Minerals	7.0%	0.64	0.46	1.6	8.3	0.46
	Average (Cap-weighted)			18.4%	0.60	0.39	1.6	6.3	0.33
	London Gold (PM Fixing $/ozt)			17.1%	1.00	0.18	-	-	-

*The exhibit above uses monthly returns of the stocks and of gold prices (represented by the London Gold PM Fixing). Equity returns are represented by MSCI ACWI IMI. The starting date for all companies is June 2002 with the exception of the following: Silver Wheaton (August 2005), Iamgold (September 2003), and New Gold (December 2004). **Regressions use the August 2005-June 2012 period, during which data is available for all the firms.

Exhibit A3: Summary Statistics on Largest Seven Companies in MSCI ACWI Select Gold Miners IMI (as of June 1, 2012)

	Company Name	Country	GICS Sub Industry	Annual Return (June 2002*-June2012)	Monthly Return Correlation with Gold (June 2002* - June 2012)	Monthly Return Correlation with Equities (June 2002* - June 2012)	Regression on Gold Prices (August 2005** - June 2012)		
							Beta	T-stat	Adj R-square
1	Barrick Gold Corp.	Canada	Gold	6.6%	0.76	0.29	1.5	11.2	0.60
2	Goldcorp Inc.	Canada	Gold	13.3%	0.73	0.28	1.7	10.1	0.55
3	Newmont Mining	USA	Gold	5.5%	0.69	0.25	1.2	9.1	0.50
4	Newcrest Mining	Australia	Gold	17.5%	0.64	0.45	1.5	7.9	0.43
5	Yamana Gold	Canada	Gold	26.3%	0.72	0.33	1.9	9.9	0.54
6	Gold Fields	South Africa	Gold	0.9%	0.66	0.29	1.3	8.6	0.47
7	Anglogold Ashanti	South Africa	Gold	2.2%	0.59	0.29	1.1	6.6	0.34
	Average (Cap-weighted)			9.8%	0.70	0.30	1.5	9.6	0.49
	London Gold (PM Fixing $/ozt)			17.1%	1.00	0.18	-	-	-

*The exhibit above uses monthly returns of the stocks and of gold prices (represented by the London Gold PM Fixing). Equity returns are represented by MSCI ACWI IMI. The starting date for all companies is June 2002 with the exception of the following: Newcrest Mining (February 2002) and Yamana Gold (February 2004). **Regressions use the August 2005-June 2012 period to be consistent with Exhibit A2.

One interesting exercise is to compare the performance of these stocks' returns in different gold price regimes, by categorizing the monthly performance of gold prices (London Gold PM Fixing) into four categories.

We divide the monthly returns of gold by quartile with the lowest quartile representing the worst gold performance and the highest quartile representing the best gold performance. For companies included in MSCI ACWI Select Gold Miners IMI, we can again see the strong relationship between their returns and gold prices. During the periods where gold performed most poorly, these names also experienced large negative returns. During the periods where gold performed the best, these names experienced large gains.

Exhibit A4: Performance During Different Gold Price Regimes (Largest Seven Companies in MSCI ACWI Select Gold Miners IMI as of June 1, 2012), Analysis Period: June 2002 to June 2012)

	Barrick Gold Corp	GoldCorp	Newmont Mining Hldgs	Newcrest Mining	Yamana Gold	Gold Fields	Anglogold Ashanti	Average	London Gold Fixing	MSCI ACWI IMI
Worst gold performance (Bottom Quartile)	-8.7%	-7.9%	-7.8%	-6.6%	-9.1%	-6.6%	-7.6%	-7.8%	-4.8%	-0.1%
Poor gold performance	-0.8%	0.4%	-0.7%	1.3%	-3.5%	-1.2%	0.5%	-0.6%	-0.1%	0.5%
Moderate gold performance	3.2%	5.7%	5.5%	4.8%	7.5%	5.4%	6.8%	5.5%	2.8%	0.1%
Best gold performance (Top Quartile)	12.2%	15.2%	9.1%	13.7%	17.7%	11.7%	8.2%	12.5%	7.4%	-0.4%

As interest in commodities investing has grown, investors have looked for ways to access the asset class more efficiently. One alternative for accessing commodities is to invest in stocks of companies whose returns are driven by their production and manufacturing of underlying commodities. For instance, comparing the characteristics of the largest names in MSCI ACWI Select Gold Miners IMI to a sample of large mining companies not included in it illustrates what the rationale behind how the index is constructed. The companies in the MSCI ACWI Select Silver Miners IMI tend to have stronger relationships (and higher correlations) with gold prices and weaker relationships (and lower correlations) with other equities.

Appendix 2: Characteristics of Commodities

There has been a great deal of research over the past few decades exploring the properties of commodities. For instance, a widely cited paper by Gorton and Rouwenhorst (2006) finds that an equally weighted index of commodity futures monthly returns over the period between July of 1959 and December of 2004 exhibit the following characteristics:

(1) Commodities historically offered the same return and Sharpe ratio as equities
(2) Commodities are negatively correlated with equity returns and bond returns. The negative correlation between commodity futures and the other asset classes is due, in significant part, to different behavior over the business cycle
(3) Commodities are positively correlated with inflation, unexpected inflation, and changes in expected inflation

The last two points are ones that researchers over the years have made in various ways. Stated a different way, first, commodities appear to have diversifying properties in a traditional equity-bond portfolio. Second, commodities have historically been good for hedging inflation.

Diversification Benefits of Commodities

To understand what is meant by diversification benefits, consider first the correlations between commodities and US equities and bonds in Exhibit B1. Commodities have correlations of 0.4 and 0.2 with equities and sovereign bonds, which are relatively low. Compared to inflation-protected (or inflation-linked) bonds and real estate, also argued to be good diversifiers, commodities have distinct properties. Commodities have much lower correlations with equities than real estate and lower correlations with sovereign bonds than inflation-protected bonds.

Exhibit B1: Global Asset Class Correlations (USD Monthly Returns, January 1998 to June 2012)

	Equities	Commodities	Sovereign Bonds	Inflation-Protected Bonds	Real Estate
Equities	1.0				
Commodities	0.4	1.0			
Sovereign Bonds	0.1	0.2	1.0		
Inflation-Protected Bonds	0.4	0.4	0.8	1.0	
Real Estate	0.8	0.3	0.3	0.4	1.0

The data series used are: Equities (MSCI ACWI IMI), Sovereign Bonds (BofA Merrill Lynch Global Government II Bond Index), Inflation-protected bonds (BofA Merrill Lynch Global Inflation-Linked Bond Index), Commodities (BofA Merrill Lynch Commodity Total Return Index), and Real Estate (MSCI World Real Estate Index). Total or gross returns are used. Sources: MSCI, BofA Merrill Lynch Global Research, used with permission.

To further understand why commodities are often believed to be good for diversification, consider an illustration from a US-based asset allocation perspective. Exhibit B2 shows the correlations of the three asset classes displayed in Exhibit B1 with a 60/40 US equity/bond portfolio over the same timeframe, January 1998 to June 2012. Commodities have had a relatively low correlation of 0.3 with the US 60/40 portfolio.

Exhibit B2: Diversification for a US Investor (Correlation of Assets to a 60/40 US Portfolio, Using Monthly Returns, USD, January 1998 to June 2012

Potential Diversifying Assets	Correlation with 60/40 US Portfolio
US inflation-protected bonds	0.3
Commodities	0.3
US Real Estate	0.6

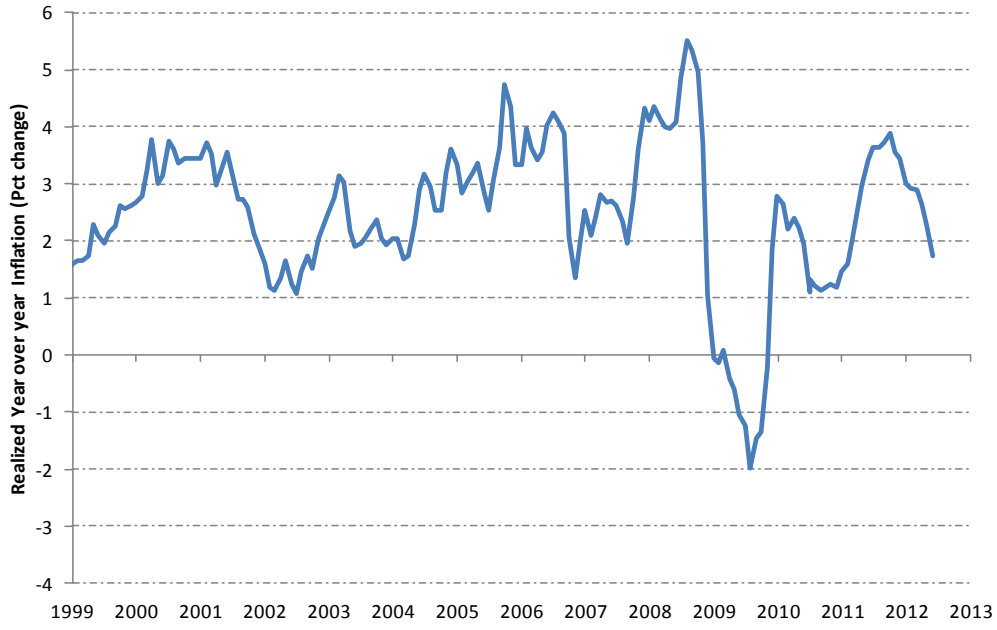
The 60/40 portfolio is comprised of the MSCI USA Equity Index and the BofA Merrill Lynch US Government Bond Index. US inflation protected bonds are represented by the BofA Merrill Lynch US Inflation-Linked Treasury Index. For Commodities, we use the Merrill Lynch Commodity Index. For Real Estate, we use the MSCI USA Real Estate Index. Total or gross returns are used. Sources: MSCI, BofA Merrill Lynch Global Research, used with permission.

For additional reading on the role of commodities in asset allocation, we refer readers to Doyle, Hill, and Jack (2007), and Ibbotson Associates (2006).

Commodities for Inflation Hedging

Next, we explore the characteristics of commodities for inflation hedging. Exhibit B3 summarizes US inflation regimes over the last decade. Inflation has averaged 2.4% since May 2002, compared to a long-term average of 3.7% since January 1948. The highest rate reached was 5.5% in July 2008, on the eve of the financial crisis. Shortly after, the inflation rate collapsed, going negative by December 2008. Other high points of inflation were in the summer of 2000 and the fall of 2005.

Exhibit B3: US Inflation (May 2002 to May 2012)



Source: US Bureau of Labor Statistics

To quantify the use of commodities for inflation hedging, we calculate the returns by asset class for inflationary (rising inflation), disinflationary (falling inflation where the level of inflation is still positive), and deflation (negative inflation) regimes. During inflationary periods in the US, commodities have returned a striking 31%, well-surpassing other asset classes. During disinflationary periods, they experienced the largest losses. The relatively strong performance during the one deflation period is an interesting anomaly. The period December 2008-October 2009 saw strong inflows into commodities during a period of exceptional market uncertainty and recession.

Exhibit B4: Average Annualized Returns to Asset Classes in the US for Different Inflation Regimes (Using Local Monthly Returns, January 1998 to May 2012)

	Equities	Commodities	Sovereign Bonds	Inflation-Protected Bonds	Real Estate
Inflationary	**5.1%**	**31.1%**	**3.3%**	**7.3%**	**4.7%**
Disinflationary	**-7.3%**	**-16.3%**	**10.2%**	**6.5%**	**6.2%**
Deflation	**36.0%**	**21.6%**	**2.0%**	**20.3%**	**67.3%**

Inflationary periods: Rising inflation (when inflation is positive) where the month-over-month inflation rate increase is greater than 0.1. Disinflationary periods: falling inflation (when inflation is positive) where the month-over-month inflation rate decrease is less than –0.1. Deflation period: negative inflation (December 2008 - October 2009). Inflationary periods and disinflationary periods are roughly equal in number.

For additional reading on the relationship between commodities returns and inflation, we refer readers to Bodie (1983), Irwin and Landa (1987), Edwards and Park (1996), and Hoevenaars et al. (2008).

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[1] *As of June 1, 2011, based on eVestment, Lipper and Bloomberg data.*