

## Commodities Investing: Challenging Conventional Assumptions about Correlation and Diversification

### Report by:

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### Executive Summary

Investors have looked to the commodity markets primarily to provide diversification benefits. Indeed, the concept of allocating a portion of a broadly diversified portfolio to commodities and other hard assets as “portfolio insurance” is virtually sacrosanct among institutional investors. However, over the last decade, the relationship between equities and commodities has begun to shift due to changing fundamentals. Understanding these dynamics, and their impact on asset allocation strategies, is of paramount importance to those investors with exposure to the asset class.

We contend that the secular outlook for commodities and natural resource equities improved materially beginning in the mid to late 1990s. One main factor driving the improvement in natural resource fundamentals is the significant decline in excess capacity for most commodities driven by nearly two decades of demand growth, particularly from emerging market countries, and limited investment in new supply. Indeed, the reduction in capacity and the rising marginal cost of supply underpin our favorable longer-term view of commodities and natural resource equities.

Importantly, the decline in excess capacity for commodities has altered the primary driver of commodity price cycles. Prior to the mid-1990s, commodity price cycles were driven largely by supply shocks and other non-economic factors – the Arab Oil Embargo in the 1970s and first Gulf War are good examples. However, as global demand continued to grow and capital reinvestment was limited, excess capacity was absorbed and a critical crossing point was reached. Instead of being impacted primarily by supply shocks, commodity cycles are now being increasingly driven by changes in global demand.

This change has resulted in a significant increase in correlations between commodities and equities over the last decade and explains why commodities largely have failed to provide portfolio insurance in volatile markets. In fact, empirical data shows that compared to direct commodity investments, natural resource equities provide similar levels of downside protection while also offering superior through-cycle returns.

In this paper, we identify and challenge several myths about the relative benefits of direct commodity investments. In the process, we present the case for employing natural resource equities as a means to diversify portfolios and protect against inflation while benefitting from the favorable long-term secular trends in the space.

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- Commodities cannot create value while advantaged natural resource companies can and do
- Natural resource equities and, particularly companies owning advantaged assets, have outperformed commodities across the cycle
- Natural resource equities can offer both enhanced return potential and unique diversification benefits to commodity and hard asset allocations

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## Myth One: “Commodities offer superior diversification benefits to natural resource equities due to their low to negative correlations with equities”

### Fact: Commodities have become increasingly correlated with equities over time

Correlations between commodities and equities have been rising, particularly during down markets. Over the last 20 years the S&P Goldman Sachs Commodity Index (GSCI) has had a correlation of 0.15 with the MSCI World Index<sup>1</sup>. However, over the last five years, that correlation has risen to 0.47. More critically, during down markets the GSCI correlation has increased significantly from 0.18 over the last 20 years to 0.57 over the last five years. The Dow Jones-UBS Commodity Index (DJUBS) has also witnessed a similar, albeit smaller, increase in correlations. The Natural Resources Sector Index (NANRSI), meanwhile, has been only marginally more correlated with equity markets than commodities during down markets over the last five years.

Exhibit 1. GSCI, DJUBS, and NANRSI Correlations with MSCI World Index				
		GSCI	DJUBS	NANRSI
<b>20 Year</b>	All Markets	0.15	N/A	N/A
	Up Markets	-0.02	N/A	N/A
	Down Markets	0.18	N/A	N/A
<b>15 Year</b>	All	0.26	0.34	N/A
	Up	0.04	0.12	N/A
	Down	0.35	0.33	N/A
<b>10 Year</b>	All	0.30	0.38	0.71
	Up	0.08	0.22	0.39
	Down	0.40	0.35	0.64
<b>7 Year</b>	All	0.33	0.43	0.75
	Up	0.06	0.22	0.46
	Down	0.42	0.36	0.67
<b>5 Year</b>	All	0.47	0.54	0.76
	Up	0.16	0.28	0.51
	Down	0.57	0.48	0.64

As of 6/30/09

### Fact: Commodities have been highly correlated with equity markets during downturns over the last decade

Since the late 1990s, there have been three significant downturns in the equity markets: the Asian Financial Crisis of 1998, the Recession of 2001, and the Financial Crisis of 2008. During each of these periods, commodities and equities have fallen by roughly similar percentages. In the most recent downturn, commodity indices, on average, actually declined more than equities and natural resource equity indices. The data below shows the strong relationship that existed between equities and diversified commodities during downturns.

Exhibit 2. Performance during market downturns			
	July-Aug '98	Feb-Sep '01	June '08-Feb '09
Russell 3000® Index <sup>2</sup>	-16.9%	-23.4%	-47.0%
FTSE All-World ex US Index <sup>3</sup>	-13.1%	-26.7%	-53.6%
S&P GSCI Commodity Index <sup>4</sup>	-13.3%	-18.9%	-64.7%
Dow Jones-UBS Commodity Index (DJUBS) <sup>5</sup>	-12.0%	-12.4%	-50.1%
S&P North American Natural Resources Sector Index (NANRSI) <sup>6</sup>	-22.3%	-17.9%	-55.5%

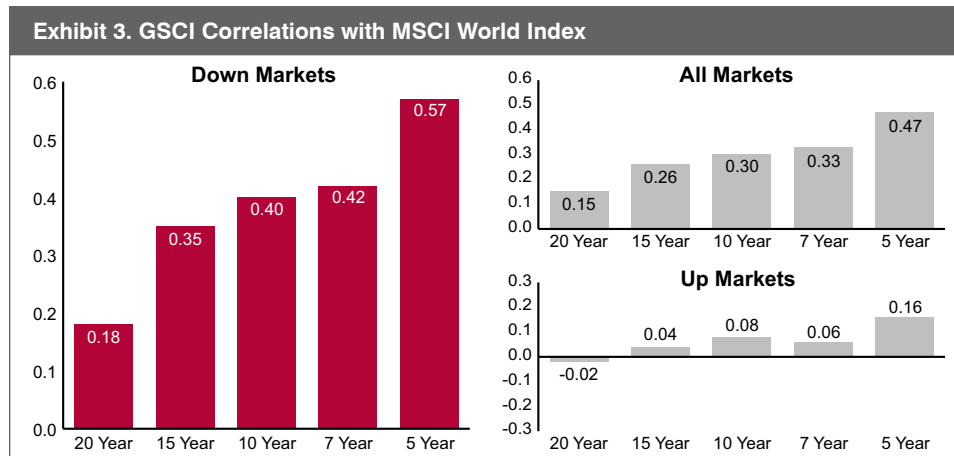
Source: RS Investments; Factset; Morningstar

The shift in correlations between commodities and equities started in the late 1990s. From that point forward, changes in global economic activity have had a more meaningful impact on commodity price cycles. Thus, while supply shocks may still lead to periods of low to negative correlation, the equity market and commodity market cycles are now driven more by a common variable: economic activity – and as such we expect correlations to remain elevated.

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**Fact: Commodities have historically derived much of their lower correlations with equities during market upturns**

Misperceptions regarding the effectiveness of using commodities as a diversifier stem from the aggregation of correlation data across different types of markets and across time periods when the underlying fundamentals were vastly different than they are today. The table below shows the correlations of the GSCI with the MSCI World Index broken down by up and down markets. It is clear that most of the lower correlation generated in “All Markets” is a function of the negative correlations generated during periods of positive performance in the equity markets – at precisely the time that “portfolio insurance” is needed least. In contrast, commodity correlations in down markets have increased significantly, rising more than 40% over the last decade. The inclusion of low to negatively correlated assets in a diversified portfolio is intended to offset negative equity returns, yet it is clear that commodities have become increasingly ineffective in that role.



As of 6/30/09  
Source: RS Investments; Factset

**Myth Two: “Commodities outperform stocks when commodity prices are rising”**

**Fact: The math suggests that natural resource equities should outperform commodities when commodity prices are rising**

In a rising commodity price environment, a rational investor would prefer to own the commodity producer over the commodity itself due to the benefits associated with operating leverage. The changes in a commodity producer’s cash flow in a rising commodity price environment are much greater than the change in the underlying commodity price.

As an example, consider an oil company with:

- 100M shares outstanding
- 1M barrels of oil produced per year
- \$50/bbl costs
- \$100/bbl oil price
- 10x cash flow stock multiple

The current stock price =

$1\text{M barrels of oil} \times (\$100/\text{bbl oil price} - \$50/\text{bbl costs}) / 100\text{M shares outstanding} \times 10\text{x cash flow stock multiple} = \$5/\text{share}$

If the price of oil rises to \$150 per bbl, the oil price increases by 50% while the stock price doubles to \$10/share ( $1\text{M} \times (150-50) / 100\text{M} \times 10 = \$10/\text{share}$ ). Thus, in a rising commodity price environment, investors should prefer equities to commodities because of this benefit associated with operating leverage.

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**Fact: Natural resource stocks have outperformed commodities over longer periods when commodity prices are rising**

The data confirms what the math suggests; stocks have outperformed commodities in a rising price environment. We believe operating leverage explains much of this outperformance. In addition, periods of above-average pricing result in permanent value creation for low-cost companies, even when commodity prices stop rising or even decline. The table below shows how natural resource equities outperformed commodities by a wide margin during the last major cyclical upturn.

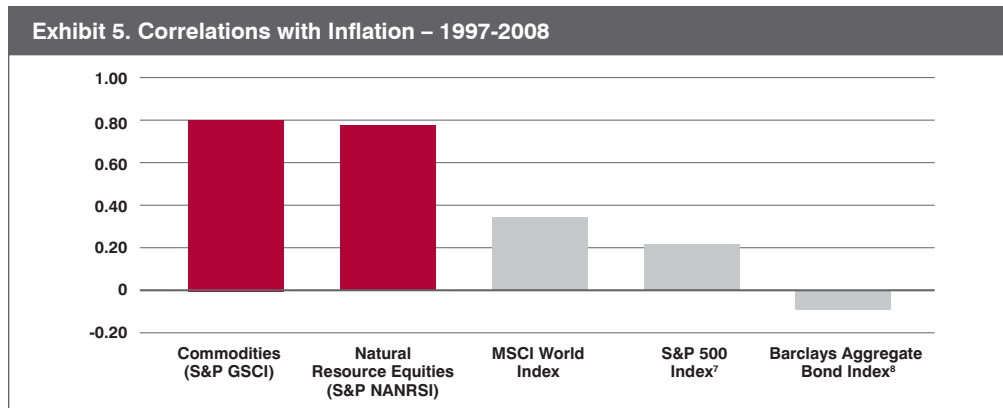
Exhibit 4. Cumulative Returns '02-'08						
Description	Feb '02-Jun '08					
S&P North American Natural Resources Sector Index (NANRSI)	266.61%					
RS Global Natural Resources Strategy (Composite, Net)	407.46%					
Dow Jones-UBS Commodity Index (DJUBS)	214.09%					
S&P GSCI Commodity Index (GSCI)	286.02%					

Average Annual Total Returns Net of Fees (as of 6/30/09)	YTD	1 Year	3 Year	5 Year	10 Year	Since Inception (11/15/95)
RS Global Natural Resources Composite	17.82%	-45.29%	-6.75%	9.93%	12.71%	9.49%

**Performance quoted represents past performance and does not guarantee future results.**  
A GIPS-compliant presentation is attached. See back page.

Thus, data suggests that natural resource equities are as useful as, or potentially even more useful, than commodities in protecting investors from commodity price inflation. In fact, although natural resource equities have historically been more correlated with the equity markets than commodities, both asset classes have exhibited similar correlations with inflation. Owing largely to the benefits of operating leverage and value creation, we expect natural resource equities will continue to outperform commodities during periods of rising prices.



Source: Factset; Bureau of U.S. Labor Statistics based on annual data: January 1997-December 2008.

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### Myth Three: “Natural resource companies destroy value; therefore, it is better to simply own the commodity”

#### Fact: Commodities cannot create value while advantaged natural resource companies can and do

Commodities themselves do not create value – they simply fluctuate in price. Natural resource companies with low-cost advantaged assets, on the other hand, can create value irrespective of changes in commodity prices because of their positions on the cost curve. Furthermore, this value compounds over time to the benefit of the long-term investor. While natural resource stocks may go up and down with movements in the underlying commodity price over short periods of time, they track changes in net asset value over longer periods of time. As a result, share prices can materially outperform commodity prices for those advantaged natural resource companies with low cost assets that consistently grow net asset value across a commodity price cycle. The ability of a natural resource company to create value is a key point of differentiation between commodities and natural resource stocks.

#### Fact: Natural resource equities and, particularly companies owning advantaged assets, have outperformed commodities across the cycle

As a result of the value created by advantaged natural resource companies, natural resource stocks have outperformed commodities across the cycle. Furthermore, the owner of advantaged assets has outperformed both the commodity and the underlying natural resource indices, which are comprised of both advantaged and disadvantaged natural resource companies. The table below shows how the stocks have outperformed the commodity and how portfolios focused on advantaged natural resource companies, such as RS Global Natural Resources Strategy, have outperformed both the commodity and the underlying natural resource indices.

Exhibit 6. 10-Year Performance Comparison As of 6/30/09					
	1 Year	3 Year	5 Year	7 Year	10 Year
RS Global Natural Resources Strategy (Composite, Net)	-45.29%	-6.75%	9.93%	13.18%	12.71%
S&P North American Natural Resources Sector Index (NANRSI)	-44.94%	-4.50%	9.33%	9.97%	6.89%
Dow Jones-UBS Commodity Index (DJUBS)	-47.08%	-8.30%	-0.23%	5.60%	7.21%
S&P GSCI Commodity Index (GSCI)	-59.68%	-15.18%	-3.45%	3.98%	6.32%
Russell 3000 Index (Russell)	-26.56%	-8.35%	-1.84%	1.45%	-1.46%

#### Fact: Natural resource equities can offer both enhanced return potential and diversification benefits to commodity or hard asset allocations

Although natural resource equities have been more correlated with the equity markets than commodities, empirical evidence suggests that investors may benefit from adding at least some actively managed natural resource equity exposure to a commodity or hard asset allocation. We believe that there are two reasons why natural resource equities may offer better potential returns and diversification benefits to commodity allocations.

First, investors in natural resource equities are able to invest in the producers of many commodities that are not currently traded in the futures markets. As a result, commodities and hard asset allocation strategies can be aided by the diversification benefits associated with investing in the producers of those commodities that are not investable through either actively or passively managed commodity portfolios. Commodities that are accessible through the public equity market, but not through the commodities exchanges include water, iron ore, potash, liquefied natural gas, uranium, power (from various generation sources including wind, solar, hydro, nuclear, and natural gas), timber, lithium, silicon, met and thermal coal, manganese, diamonds, aggregates, steel and specialty alloys, salt, phosphate, rare earth metals, titanium, industrial gases, and ammonia. Importantly, many of these commodities are impacted by factors not directly related to economic activity including changes to the weather, land usage, global dietary standards, population growth, and technology.

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The second reason why natural resource equities may improve the expected risk-adjusted returns of commodity portfolios is the fact that low-cost producers of commodities with steep cost curves can and do create value across a commodity price cycle. The value creation associated with low-cost commodity producers can represent a very meaningful source of returns for a natural resource equity strategy that cannot be captured through direct investments in commodities. In addition, this value creation is permanent and compounds over time. The table below shows the risk-adjusted returns and down market correlations of the various commodity and natural resource equity indices and RS Global Natural Resources Strategy over the past 10 years.

<b>Exhibit 7. 10-Year Performance, Standard Deviation, Sharpe Ratio, and Correlation Statistics As of 6/30/09</b>					
	<b>Cumulative Return</b>	<b>Annualized Return</b>	<b>Annualized Standard Deviation</b>	<b>Sharpe Ratio</b>	<b>Down Market Correlation to MSCI World</b>
RS Global Natural Resources Strategy (Composite, Net)	230.94%	12.71%	24.01	0.40	0.50
S&P North American Natural Resources Sector Index (NANRSI)	94.66%	6.89%	23.24	0.16	0.64
Dow Jones-UBS Commodity Index (DJUBS)	100.64%	7.21%	17.49	0.24	0.35
S&P GSCI Commodity Index (GSCI)	84.56%	6.32%	25.38	0.13	0.40

Performance excludes sales charge.

Using the data from above, we constructed two portfolios blending the various commodity and natural resource indices. The table below shows the risk-adjusted returns and down market correlations for those commodity/natural resource equity blended portfolios and highlights the significant improvement in returns. In fact, over the last 10 years, adding natural resource equities to a commodity allocation would have resulted in a material improvement in risk-adjusted returns, as measured by the Sharpe Ratio, with only a small increase in correlations with the equity markets during downturns.

<b>Exhibit 8. 10-Year Performance, Standard Deviation, Sharpe Ratio, and Correlation Statistics – Blended Portfolios As of 6/30/09</b>					
	<b>Cumulative Return</b>	<b>Annualized Return</b>	<b>Annualized Standard Deviation</b>	<b>Sharpe Ratio</b>	<b>Down Market Correlation to MSCI World</b>
Commodities (DJUBS) and RS Global Natural Resources Strategy 50/50	155.52%	9.84%	19.06	0.35	0.46
Commodities (GSCI) and RS Global Natural Resources Strategy 50/50	153.31%	9.74%	22.05	0.30	0.48
Commodities (DJUBS) and Natural Resource Equities (NANRSI) 50/50	105.03%	7.44%	18.66	0.23	0.54
Commodities (GSCI) and Natural Resource Equities (NANRSI) 50/50	100.86%	7.22%	21.81	0.19	0.54

The Blended Portfolios shown in Exhibit 8 are not actual accounts. These hypothetical portfolios were achieved by the retroactive combination of 50% each of the Strategy or NANRSI and the commodity indices named. In the Blended Portfolios that include the Strategy, the returns of the commodity indices have been reduced by estimated hypothetical fees and expenses that would have applied if the indices had been available as ETFs during the full 10-year period.

## Conclusion

The role of commodities in a diversified portfolio is well established. Due to low to negative historical correlations with equities, some have taken the view that an allocation to commodities may act as “portfolio insurance” to off-set declines in equity values. More recently, however, investors have been forced to reassess this presumption due to the actual performance of commodities during corrections in equity markets. Specifically, commodities have declined in line with equities over the past decade and correlations in down markets have increased substantially. In this paper, we attempted to explain the forces behind the change in the historical relationship between equities and commodities, and to offer insight into a number of widely-held conclusions, which we contend are based on historical aggregated correlations and are not supported by facts.

To construct a diversified portfolio, investors need to understand the dynamics that underlie return streams, not simply rely on historical relationships between asset classes or securities. These relationships can and do change as fundamental factors change. Clearly, there is a role for exposure to commodities in an asset allocation model. What is less clear is whether or not direct commodity exposure is the preferred option. Given the fact that both commodity cycles and equity markets are increasingly impacted by changes in global economic activity, and due to the enhanced diversification and potential returns achievable via natural resource equities, we contend that investors may be better served by including actively managed natural resources in an asset allocation model.

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Investing in small- and mid-size companies can involve risks such as having less publicly available information, higher volatility, and less liquidity than in the case of larger companies. Portfolios that concentrate investments in a certain sector may be subject to greater risk than portfolios that invest more broadly, as companies in that sector may share common characteristics and may react similarly to market developments or other factors affecting their values. Investments in companies in natural resources industries may involve risks including changes in commodities prices, changes in demand for various natural resources, changes in energy prices, and international political and economic developments. Foreign securities are subject to political, regulatory, economic, and exchange-rate risks not present in domestic investments. The value of a debt security is affected by changes in interest rates and is subject to any credit risk of the issuer or guarantor of the security.

- 1 The MSCI World Index is a free float-adjusted market capitalization weighted index that is designed to measure the equity market performance of developed markets. As of June 2007 the MSCI World Index consisted of the following 23 developed market country indices: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Hong Kong, Ireland, Italy, Japan, Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, the United Kingdom, and the United States.
- 2 Russell 3000® Index measures the performance of the 3,000 largest U.S. companies based on total market capitalization, which represents approximately 98% of the investable U.S. equity market. As of the latest reconstitution, the average market capitalization was approximately \$4.8 billion; the median market capitalization was approximately \$944.7 million. The index had a total market capitalization range of approximately \$182.6 million to \$386.9 billion. Index results assume the reinvestment of dividends paid on the stocks constituting the index. You may not invest in the index, and, unlike the strategy, the index does not incur fees or expenses.
- 3 The FTSE All-World ex US Index is part of a range of indexes designed to help US investors benchmark their international investments. The index comprises Large (84%) and Mid (16%) cap stocks providing coverage of Developed and Emerging Markets (46 countries) excluding the US. The index is derived from the FTSE Global Equity Index Series (GEIS), which covers 98% of the world's investable market capitalization.
- 4 The S&P Goldman Sachs Commodity Index (GSCI) is used in this paper to illustrate the risk and returns of an investment in commodities. It is a composite index of commodity sector returns, representing an unleveraged, long-only investment in commodity futures that is broadly diversified across the spectrum of commodities. The returns are calculated on a fully-collateralized basis with full reinvestment. The combination of these attributes provides investors with a representative and realistic picture of realizable returns attainable in the commodities markets.
- 5 The Dow Jones-UBS Commodity Index (DJUBS) is used in this paper to illustrate the risk and returns of an investment in commodities. It is composed of futures contracts on 19 physical commodities. The commodities in the index are traded on U.S. exchanges, with the exception of aluminum, nickel and zinc, which trade on the London Metal Exchange (LME).
- 6 The S&P North American Natural Resources Sector Index™ (NANRSI), which is not covered by the report of independent accountants, is a modified capitalization-weighted index of companies involved in the following categories: extractive industries, energy companies, owners and operators of timber tracts, forestry services, producers of pulp and paper, and owners of plantations. Index results assume the reinvestment of dividends paid on the stocks constituting the index. Index results assume the reinvestment of dividends paid on the stocks constituting the index and do not include any transactions costs, management fees or other costs. As of December 31, 2007 the strategy has changed its benchmark from the Lipper Natural Resources Fund Index to the S&P North American Natural Resources Sector Index because the S&P North American Natural Resources Sector Index is composed of securities of companies in the natural resources sector while the Lipper Natural Resources Fund Index is composed of mutual funds that invest in the natural resources sector.
- 7 S&P 500® Index is an unmanaged market capitalization-weighted index of 500 stocks designed to measure performance of the broad domestic economy through changes in the aggregate market value of 500 stocks representing all major industries. Index results assume the reinvestment of dividends paid on the stocks constituting the index. You may not invest in the index, and, unlike the strategy, the index does not incur fees and expenses.
- 8 The Barclays Capital U.S. Aggregate Index is a broad-based bond index comprised of government, corporate, mortgage and asset-backed issues, rated investment grade or higher, and having at least one year to maturity. Unlike the strategy, the index does not incur fees or expenses.

Year	Gross of Fees Total Return (%)	Net of Fees Total Return (%)	S&P North American Natural Resources Sector Index™ e (%)	Number of Portfolios	Composite Assets (\$millions)	Total Firm Assets (\$billions)	% of Firm Assets	Composite Dispersion
1999	24.93%	22.39%	27.23%	1	22.8	8.1	0%	n/m
2000	28.32%	25.85%	15.79%	1	29.4	8.7	0%	n/m
2001	2.50%	0.61%	-15.59%	1	21.8	7.0	0%	n/m
2002	19.10%	17.04%	-12.99%	1	38.8	4.2	1%	n/m
2003	44.65%	42.30%	34.40%	2	154.0	7.2	2%	n/m
2004	36.77%	34.82%	24.59%	2	647.1	8.4	8%	n/m
2005	44.32%	42.26%	36.61%	2	1,737.1	10.0	17%	n/m
2006	9.72%	8.11%	16.85%	3	1,648.0	16.8	10%	n/m
2007	33.95%	32.08%	34.44%	5	2,240.9	18.1	12%	n/m
2008	-45.89%	-46.73%	-42.55%	5	937.0	10.2	9%	0.002

**Strategy:** The RS Global Natural Resources Composite invests principally in equity securities of issuers in natural resources industries, and may invest in securities of companies located anywhere in the world, including the United States.

**Standard Fee Schedule:**  
1.00% Assets up to \$30M  
0.80% Assets \$30M-\$50M  
0.60% Assets over \$50M

**Past performance is not a guarantee of future results. More current information on performance may be available by contacting RS Investments. RS Investments (the "Firm") has presented and prepared this report in compliance with the Global Investment Performance Standards (GIPS®).**

RS Investments' claim of compliance has been verified on a firmwide basis for the periods January 1, 1998 through December 31, 2001 and January 1, 2004 through December 31, 2007 by PricewaterhouseCoopers LLP and for the periods January 1, 2002 through December 31, 2003 by Ernst & Young LLP. In addition, the performance results of the RS Global Natural Resources Composite have been examined for the periods January 1, 2003 through December 31, 2007 by PricewaterhouseCoopers LLP. A copy of the verification report is available upon request.

RS Investments is defined as RS Investment Management Co. LLC, an investment adviser registered under the Investment Advisers Act of 1940. The Firm was previously defined as the total assets managed by RS Investment Management L.P., RS Investment Management, Inc., RS Value Group LLC, and RS Growth Group LLC. On August 31, 2006 RS Investment Management Co. LLC ("RS") entered into an agreement with The Guardian Life Insurance Company of America ("Guardian") in which Guardian took a majority ownership position in RS Investments (the "Transaction"). In connection with the Transaction, RS undertook a simplification of its corporate structure and consolidated the investment advisory function under one entity. RS Investment Management, L.P., RS Investment Management, Inc., RS Value Group LLC, and RS Growth Group LLC (the "Advisers") are subsidiaries of RS. Immediately after the close of the Transaction, RS assumed the investment advisory functions previously performed by the Advisers.

The RS Global Natural Resources Composite includes all discretionary accounts invested in the Global Natural Resources Strategy. Accounts must be under management for at least one full month to be included in the composite. Closed accounts remain in the composite through the last full month under management. Results prior to 2003 represent the returns of a single account.

The RS Global Natural Resources Composite results are time weighted rates of return net of transactions costs, and have been presented both gross and net of investment advisory fees. Monthly composite returns are calculated by weighting each account's monthly return by its beginning value as a percent of the total composite's beginning market value. Quarterly and annual returns are calculated by linking the monthly and quarterly returns, respectively, through compounded multiplication. Valuations and returns are computed and stated in U.S. dollars. Returns are net of foreign withholding taxes. Additional information regarding policies for calculating and reporting returns is available upon request.

Composite dispersion is the standard deviation of asset-weighted gross annual returns for portfolios active the entire year, and is reported as not meaningful (n/m) if fewer than five accounts were active the entire year.

The RS Global Natural Resources Composite was created in November 1995.

A complete list and description of the Firm's composites is available upon request.

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