



# Facts and myths about commodity investing

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Research & Analysis

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- Commodity performance has been very inconsistent over the last 40 years, with various booms and busts.
- Despite the bull market in commodities over the last few years, returns for long-only investors have been disappointing due to the roll yields which have been a drag on commodity index returns.
- Commodity hedge funds allow investors to benefit from the favourable attributes of the asset class, but provide better downside protection and mitigate negative roll yields. Overall, we believe commodity hedge funds offer a superior approach.

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## Facts and myths about commodity investing

This paper aims to give investors an overview of the facts and myths about commodity investing. We examine key performance drivers of historical commodity returns and research several characteristics that investors commonly attribute to commodities such as diversification, low correlation to equities and inflation-hedging characteristics. Moreover, we contrast long-only investments, such as commodity index-linked ETFs, with commodity hedge funds. Our goal is to demonstrate the benefits of commodity investing in general as well as the superior attributes of investing in commodities through hedge funds. For this purpose, throughout the paper, we raise and resolve pertinent questions, as well as address concerns investors may have towards investing in commodities. As such, the paper follows a Q&A structure.

### What are commodities and how are they valued?

Commodities are physical assets (such as precious or base metals), energy products (such as crude oil or natural gas), agricultural goods (such as wheat or corn), livestock, and various other standardised raw materials. In financial markets, commodities are accessed either by buying or selling shares of commodity producers (i.e. commodity equities) or by trading commodity futures or other derivative contracts. As a niche strategy, direct physical investment can also be an option.<sup>1</sup> Unless otherwise stated we relate to commodity futures contracts when referring to commodities in general. One major difference between commodities and other capital assets, such as bonds and stocks, is that commodities do not provide a future cash flow stream. Hence, there is no commonly agreed valuation method such as present value of future cash flows. Nor is there a book value, a sum-of-the parts or a price-earnings multiple. Moreover, strategically significant commodities such as oil or gold often do not follow basic supply and demand patterns. Instead, their value is often determined by psychological factors. Oil, for example, is sometimes said to carry a 'terror premium' particularly around times when conflicts (e.g. Iran-Israel) are heating up. It is important to note that these factors are not directly observable.

### How long have commodities been an investable asset class?

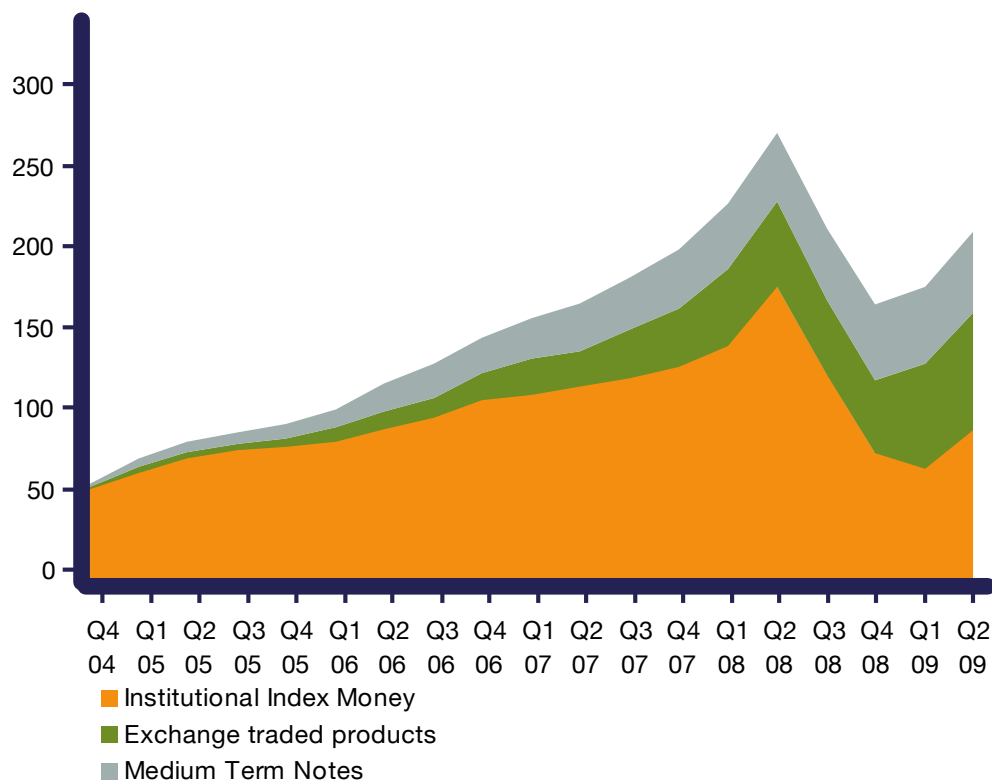
Although the concept of commodities as an investable asset class has existed for some time, the transition into a mainstream asset class is a fairly recent phenomenon. Considerable inflows into commodity index-linked ETFs started around 2004 and rapidly gained momentum from 2005 onwards. Even after the sharp sell-off in H2 2008 the asset class did not lose its appeal and received strong inflows during 2009. According to Barclay Capital, there are about USD 210 billion in commodity assets under management, the vast majority of which are institutional money and managed passively. According to JPMorgan estimates, assets worth USD 55 billion are linked to the S&P GSCI Index and USD 30 billion to the DJ UBSCI Index.<sup>2</sup>

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<sup>1</sup> Direct physical investment can be done with precious metals as they are cheap and easy to store. Base metals, such as copper, are also partly applicable for physical trading whereas softs and energy products are not practical.

<sup>2</sup> JPMorgan Commodity Research. Estimates as at 31 August 2009.

Figure 1: Commodity-linked assets have peaked in 2008 but are again on the rise



Source: Barclay Capital. Time period analysed: 1 October 2004 to 30 June 2009. Assets shown in billion USD.

### What kinds of commodity indices exist? How do these indices work?

The three most widely used commodity indices are the S&P GSCI (formerly known as Goldman Sachs Commodity Index), the DJ UBS Commodity Index (former DJ-AIG) and the Reuters Jefferies CRB Index. Additionally, several other indices have gained popularity over the last few years, such as the Rogers International Commodity Index (RICI) and the Deutsche Bank Liquid Commodity Index (DBLCI). The next figure summarises the key characteristics of these indices:

Figure 2: Commodity indices at a glance

General characteristics	S&P GSCI	DJ UBSCI	RJ CRB	DBLCI	RICI
Index inception	1970	1991	1982	1988	1998
Investable since	2001	1998	1986	2003	1998
Number of commodities included in the index	24	19	19	6	36
Weighting methodology	World production weighted	2/3 liquidity data weighted and 1/3 production weighted	Equal-weighted	Liquidity data	Based on open commercial interest
Rebalancing methodology	Monthly	Annually	Monthly	Continuously	Monthly
Roll frequency and dates	Monthly, 5 <sup>th</sup> - 9 <sup>th</sup> business day	Monthly, 6 <sup>th</sup> – 10 <sup>th</sup> business day	Monthly, 1 <sup>st</sup> – 4 <sup>th</sup> business day	Energy: monthly Non-energy: annual	Monthly
Diversification constraints	None	33% cap on sector, 2% minimum weight	None	None	None

Sector weights <sup>3</sup>	S&P GSCI	DJ UBSCI	RJ CRB	DBLCI	RICI
Energy	70%	33%	39%	51%	44%
Metals (base and precious)	11%	26%	20%	26%	21%
Agriculture	15%	30%	34%	23%	35%
Livestock	4%	11%	7%	0%	0%

Source: Morningstar and Index providers.

All these indices are based on the concept of fully collateralised total returns. This means that there is no leverage implied in the strategy, as the full notional amount from the futures contracts is invested in a risk-free USD asset, usually in 3-month US T-bills. The index provider follows a rule-based strategy and automatically rolls the futures contracts before they expire. Most indices use near-term contracts with 0-3 months to expiration. By rolling these contracts on a regular basis they can generate an additional source of return (or loss) as we will explain later on. As a basic concept, it is important for investors to understand that both interest income stemming from the collateral as well as the ongoing rolling of the futures contracts are significant performance drivers for commodity investments. Obviously, the actual price fluctuations of the underlying commodities are also important.

For the calculation of commodity returns, either excess returns or total returns can be taken into consideration.<sup>4</sup> The common terms used are as follows:

Figure 3: Common terms used for commodity return calculations

	Spot price change + roll yield + interest income
Excess return	Spot price change + roll yield
Spot return	Spot price change only

Source: Man Investments.

## Where are commodities traded?

Commodities are traded on regulated futures exchanges around the world. The most relevant exchanges are listed in the next figure.

Figure 4: Overview of commodity exchanges

Commodity exchange	Full name	Location	Main commodities traded	Comment
NYMEX	New York Mercantile Exchange	New York	Energy and metals	Commodity exchange with highest profile, acquired by CME Group in 2008
ICE	Intercontinental Exchange	Atlanta	Energy and softs	Expanded into agriculturals through its acquisition of NYBOT
LME	London Metal Exchange	London	Base and precious metals	

<sup>3</sup> Sector weights are rounded to full percentage points.

<sup>4</sup> We believe that excess returns should be used to study the characteristics of the commodity asset class, particularly over long time periods. By excluding interest rates the asset class' inherent properties are better captured as interest income is not a return source from commodities but rather of the general level of short-term US interest rates.

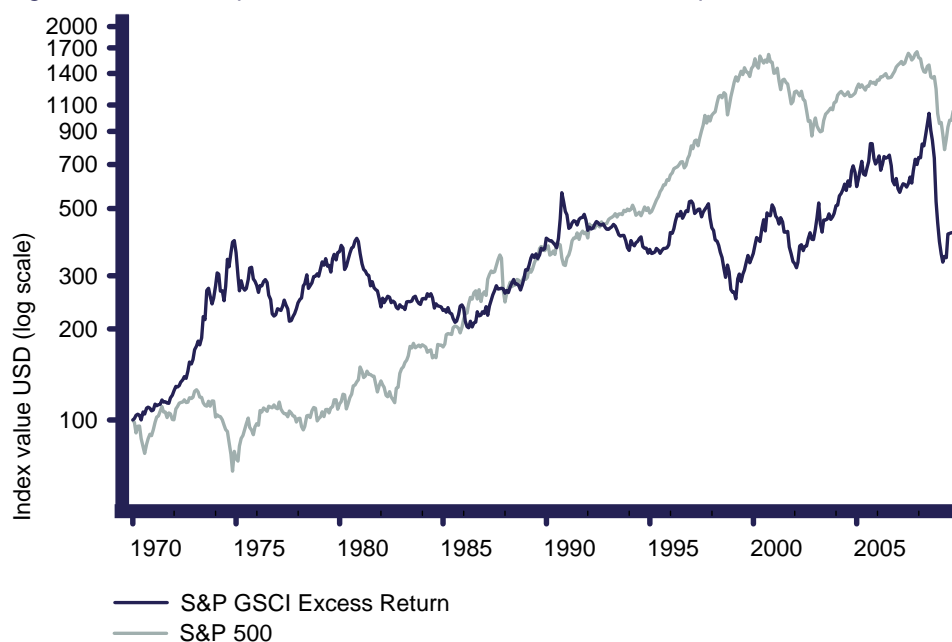
COMEX	New York Commodity Exchange	New York	Precious metals	Now part of CME Group
CME Group	(merger between Chicago Mercantile Exchange, Chicago Board of Trade and NYMEX)	Chicago	Full scale futures exchange	
TOCOM	Tokyo Commodity Exchange	Tokyo	Precious metals, energy	
LIFFE	NYSE Liffe	London	Agriculturals	Now part of NYSE Euronext

Source: Commodity exchanges company's websites. Please note that this list is not mutually exclusive.

### How have commodities performed historically?

Investor interest in commodities has soared in recent years as the asset class has outperformed traditional assets such as stocks and bonds. The performance of commodities as an asset class is usually measured by a commodity index such as shown in figure 2. The S&P GSCI has the longest history, the greatest amount of assets tied to it and is generally the most widely observed index.

Figure 5: Historical performance of commodities versus equities



Source: Bloomberg. Time period analysed: 1 January 1970 to 31 August 2009.

The above figure shows that commodity performance has been very inconsistent with various booms and busts occurring over the last 40 years. The most recent bust was in 2008/2009 when the S&P GSCI lost over 67% in just eight months.<sup>5</sup> It is also astonishing to see that even over a 20-year period, negative returns are possible.<sup>6</sup> In comparison, equities have never suffered a negative 20-year period.<sup>7</sup> As a consequence, results of a historical performance analysis will largely depend on the time period studied. If one excludes the 1970s, the results look very different.<sup>8</sup> Another large difference arises if total returns are considered. For our comparison in figure 5 we used excess

<sup>5</sup> July 2008 – February 2009

<sup>6</sup> The S&P GSCI (excess return) showed negative performance over a 20-year holding period in 1995, 1999 and 2008.

<sup>7</sup> Except, of course, in Japan.

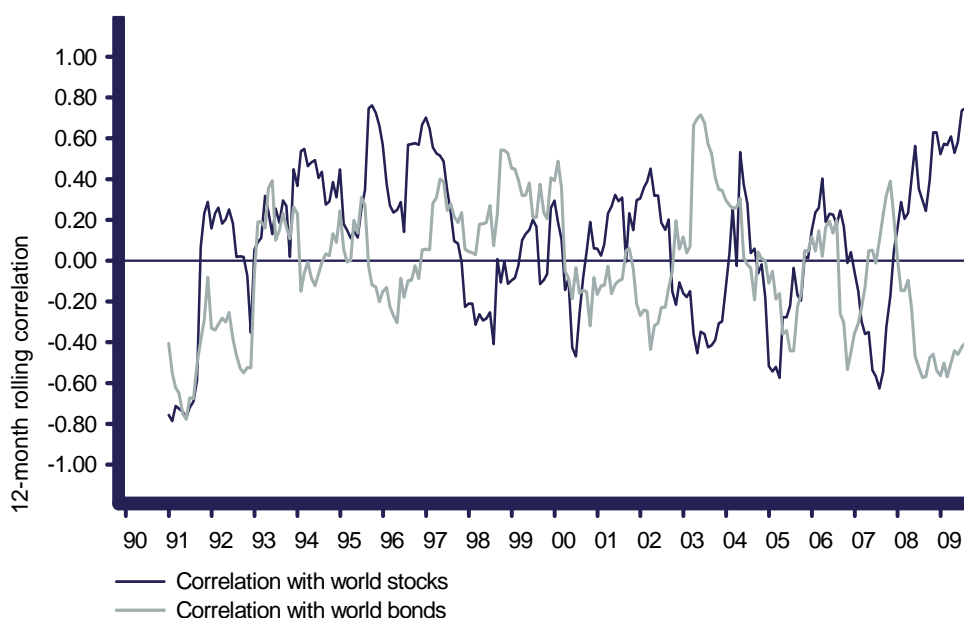
<sup>8</sup> The S&P GSCI (excess return) returned 260% from 1.1.1970 – 31.12.1979 and just 15.6% from 1.1.1980 – 31.08.2009.

returns (spot price changes + roll yields) as a proxy for overall commodity performance, since we believe that excess returns better reflect the performance of commodities as an asset class.<sup>9</sup>

### How do commodities add value in terms of diversification and low correlation with other asset classes?

Historically, commodity excess returns have had no stable correlation with traditional asset classes, such as stocks and bonds, as can be seen in figure 6.<sup>10</sup> Over the last two decades, correlations have fluctuated between -.80 and +.80 and have never remained positive or negative for an extended period of time. It is important to note that occasionally the correlation can be quite high, e.g. in 1996/97 and currently. In 2008, commodities peaked in June (as seen on figure 5) and subsequently fell sharply along with all other risky assets at the time, and in the aftermath, of the collapse of Lehman Brothers. Since February 2009, commodities have rebounded strongly, again in sync with other risky assets. As a result, the current 12-month rolling correlation of commodities with equities is very high. If history is any guide, we would expect this value to decline again soon.

Figure 6: Rolling 12-month correlations of commodities versus equities and bonds have been inconsistent



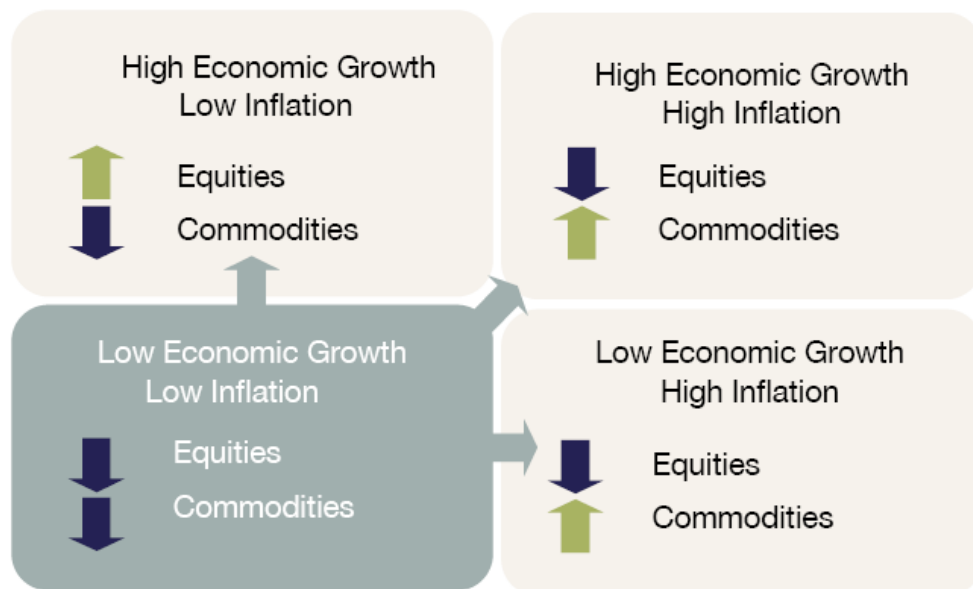
Source: Bloomberg. Time period analysed: 1 January 1990 to 30 September 2009. Commodities: S&P GSCI excess return, stocks: MSCI World TR (hedged to USD), bonds: Citigroup Global Government Bonds (All maturities, hedged to USD).

With respect to diversification, it is also important to keep in mind how macro-economic factors influence asset returns over longer time periods, e.g. 5-10 years. If one examines returns by decade, commodities have been excellent diversifiers. In the 1970s, for example, commodities did well while bonds and stocks suffered. In the 1980s and 1990s stocks and bonds did well while commodities struggled and in the 2000s commodities are again in the ascendancy. The next figure illustrates four different economic scenarios and indicates how equities and commodities are likely to perform, based on historical experience. As a general concept, commodities benefit from an inflationary scenario in both a high or low growth environment. On the other hand, under a low inflation or even deflationary regime, commodities tend to underperform.

<sup>9</sup> See explanation on page 5

<sup>10</sup> While we use 12-month rolling correlation, our analysis has shown that results for 24-month rolling correlation are very similar.

Figure 7: Expected performance of commodities and equities during different economic scenarios



Source: Morgan Stanley Commodity Research July 2009. Morgan Stanley concludes that returns are only correlated in the lower left quadrant.

In addition to the diversification aspects of the overall commodity asset class, it is also important to note that commodities themselves also have low correlations with each other. This is different from the equity market, where equities have a beta to the overall markets. In commodities, there is no 'market beta' as such. Moreover, the underlying commodity sectors such as energy, industrial metals, precious metals, agriculture and livestock have shown quite a large return dispersion. The spread between the best and worst performing sector, for example, was at least 30 percentage points in 19 of the 20 years.<sup>11</sup> Even within the same sector, large dispersions are common. For example this year, crude oil is up strongly while natural gas is down significantly.

### How are commodity returns distributed? Is there a fat tail?

Most asset classes do not have a normal return distribution. They either have a skewness<sup>12</sup> or kurtosis.<sup>13</sup> Most common is negative skewness and leptokurtosis which means that outliers are more frequent than the standard deviation would suggest and that those outliers are more likely to be negative than positive. Hence, a risk/return metric that assumes a normal distribution tends to underestimate the true risks. Commodities, on the other hand, have the rare characteristic of positive skewness. This means they have a fat tail on the upside. One can also argue that commodities, as an asset class, may offer investors a hedge against event risk. Such an event could be a terrorist attack, war, hurricane or an earthquake. Immediately following such an event, it is likely that prices of some commodities will rise sharply due to supply risks. Examples in the past include 9/11 in 2001 where gold rose sharply<sup>14</sup> or hurricane Katrina in 2005 where natural gas prices surged due to damaged pipelines.<sup>15</sup> While commodities tend to react to such events with rising prices, other assets like equities show opposite reactions. This rare attribute of positive skewness increases the robustness of a diversified portfolio with an allocation to commodities.

<sup>11</sup> According to Van Eck Global Research

<sup>12</sup> Asymmetry of probability distribution commonly referred to as fat tail

<sup>13</sup> A measure of the peakedness of the probability distribution

<sup>14</sup> 8% immediately after the attack

<sup>15</sup> 20% during September 2005

## What are the return components of commodity indices?

As we explained earlier, fully collateralised commodity indices have a number of return drivers. These are:

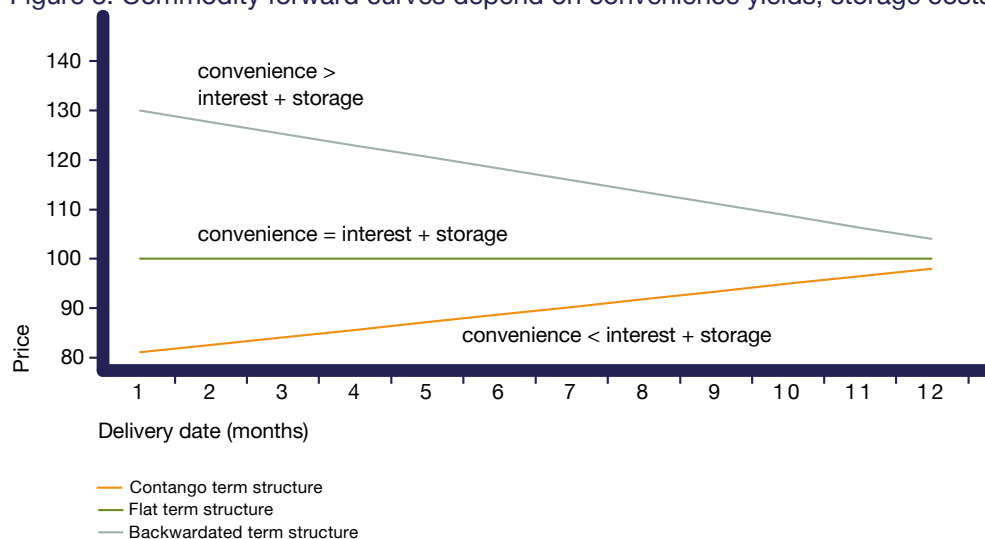
- Changes in spot prices
- Roll returns
- Interest income from the collateral

A number of academic researchers<sup>16</sup> have tried to decompose historical returns into these basic factors. Results have shown somewhat different numbers, largely dependent on the time period the returns were analysed. Interest income constituted a large return source during high interest rate periods, such as in the mid-1970s and early 1980s when risk-free rates in the US reached over 10%. Conversely, in a zero-interest rate environment, as today, almost no income can be generated on the collateral. With respect to roll returns, most research points to a high significance and concludes that roll yields have been a dominant driver of overall commodity returns.<sup>17</sup>

## What drives the shape of the futures curve?

Understanding commodities is impossible without an appreciation of the concepts of storage costs, interest rates and convenience yield.<sup>18</sup> These factors largely drive the shape of a commodity's futures curve.<sup>19</sup> The shape of the curve affects the roll yield and research has shown that roll yields explain a significant portion of the overall commodity returns.<sup>20</sup> The two basic shapes of forward curves are contango and backwardation. Contango is an upward sloping curve, i.e. when prices at longer maturities are higher than the current spot price. Backwardation is the opposite. Some commodities are more likely to be in contango, while others are usually backwardated. It is also possible for a commodity to frequently shift from contango to backwardation and vice versa. Physical storage factors drive the term structure, which in turn drives the returns. Commodities that typically trade in backwardation tend to outperform commodities that trade in contango for a buy and hold investor. The next figure illustrates the basic relationship between convenience yield, storage costs and interest rates.

Figure 8: Commodity forward curves depend on convenience yields, storage costs and interest rates



Source: Deutsche Bank commodity research. Schematic illustration only.

<sup>16</sup> Such as Erb and Harvey (2005), Gorton and Rouwenhorst (2006), Greer (2005)

<sup>17</sup> See Nash and Shrayar (2004), Feldman and Till (2006)

<sup>18</sup> Convenience yield refers to the benefit of holding the physical asset or the nearest futures contract in case of a supply disruption. The convenience yield can be zero if there is ample inventory or it can be very high in case of low inventory combined with a supply disruption.

<sup>19</sup> A commodity futures (or forward) curve is comparable to the yield curve (or term structure) of interest rates.

<sup>20</sup> UBS claims that about 80% of historical returns since 1970 can be explained by roll yields. Gorton et.al. (2008) observe an explanatory power of 52%. The somewhat lower significance comes from selecting a slightly different pool of commodities and observation period.

But what drives the shape of the curve? This brings us back to storage costs and convenience yield. Storage costs can be significant and, *ceteris paribus*, should cause the future price to be higher than the current price (i.e. upward sloping contango). This is because delivery at a later date is more expensive if the commodity has to be stored until then. The convenience yield, on the other hand, is the opposite factor. Sometimes it is better to have the commodity available at short notice. For example, if a refinery does not receive crude oil in time, it might have to shut down part of its operations. The cost of shutting down and restarting is often considerable. To avoid delivery risk, physical oil buyers may be willing to pay more for contracts that provide delivery in the near term.<sup>21</sup> This extra value is similar to an insurance premium. Holding everything else constant, the convenience yield should cause futures curves to slope downwards (backwardation). In reality, these two forces interact and most commodities can be both in contango or backwardation at different points in time. As we explain later, some commodities are more likely to be in consistent contango while others frequently shift. Moreover, seasonal factors, the weather and various other factors also play a role. Absolute and relative storage costs are summarised in the next figure.

Figure 9: Typical storage costs for selected commodities

Commodity	Current price <sup>22</sup>	Unit	Storage costs/month	Relative storage costs/month	Source
Crude oil	65	Barrel	0.70	12.92%	UBS estimate
Natural gas	3.5	MMBTU	0.30	50-100%	UBS estimate
Gold	950	Oz.	Almost nil	< 1%	UBS estimate
Aluminium	1,700	Ton	11.70	8.26%	LME warehouse rents
Copper	5,300	Ton	10.20	2.31%	LME warehouse rents
Nickel	16,000	Ton	12.60	0.95%	LME warehouse rents
Zinc	1,650	Ton	10.20	7.42%	LME warehouse rents
Corn	3.20	Bushel	0.06	22.50%	UBS estimate

Source: UBS, all figures in USD.

Interestingly, storage costs vary greatly from one commodity to another. The ultimate luxury commodity is natural gas, as its annual storage costs at times reaches 100% of its value. Natural gas is commonly stored in underground reservoirs coming from depleted gas fields. These are very capital intensive to maintain, partly because there needs to be a permanent volume of gas to keep adequate pressure throughout operation. Another expensive commodity to store is corn. Agricultural products cannot be stored forever, and in order to increase their storage life they need to be dried, causing shrinkage. These factors, together with the natural harvesting cycle create a strong seasonal pattern in forward prices.<sup>23</sup> Commodities that are cheapest to store are base metals and gold.

Figure 10: Broad grouping of commodities according to supply risk and storage costs

		Supply risk	
		Low	High
Storage costs	Low	Precious metals	Base metals
	High	Agriculturals, Natural gas	Energy

Source: UBS.

<sup>21</sup> Convenience yield is high when inventories are low and vice versa

<sup>22</sup> Figures in table are as of 27 July 2009, all figures in USD

<sup>23</sup> UBS Investment Research: Physical storage and commodity returns

Commodities which have a high supply risk (base metals, energy) can trade in either contango or backwardation, depending on the convenience yield and inventory levels. In case of high inventories, the convenience yield is low and contango is likely. On the other hand if inventories are low and there is a possible supply disruption, the convenience yield is high and backwardation is likely. Alternately, there are commodities with a low supply risk. These commodities have a low or non-existent convenience yield and are normally contangoed. Agriculturals and natural gas tend to trade in rather steep contango due to their high storage costs and low supply risk.

### What are the implications of contango and backwardation to a long-only investor?

To a long only investor backwardation is favourable since a return can be made even if spot prices do not move. Contango, on the other hand, creates a roll loss and money can only be made if the spot price exceeds the roll loss. For commodities that have historically been in contango, this can have serious consequences as roll losses add up over time. UBS research has shown that natural gas and corn have generated consistently negative performance due to roll losses as seen in the next figure.<sup>24</sup> Crude oil and copper, on the other hand, have been the best performers due to positive roll returns. JPMorgan estimates that overall, roll returns have exerted a drag of 3% to 4% p.a. on commodity index returns over the last 18 years.<sup>25</sup>

Figure 11: Annual performance of five benchmark commodities including roll returns since 1990

	Natural gas	Corn	Gold	Copper	Crude oil (WTI)
Average basis <sup>26</sup>	-17.5%	-11.2%	-3.8%	2.6%	2.7%
Excess return <sup>27</sup>	-13.0%	-8.0%	0.5%	6.7%	7.5%

Source: UBS, Bloomberg. Time period analysed: January 1990 to December 2008.

Investors also have to keep in mind that the impact of contango or backwardation is most pronounced at the very front end of the futures curve, where most index money is placed. A good example is the price movement of crude oil during 2009. While spot prices rose 57%, the eight monthly roll losses detracted 58% and left investors with a slight loss of 0.95%.<sup>28</sup> Overall, index roll losses accumulated to 25.7%.<sup>29</sup> These were certainly extreme levels of roll losses which were mainly caused by the huge glut of oil inventories in the US. However, as seen in the next chart, the oil price futures curve is still in considerable contango which will cause roll losses to persist, albeit at a lower level. As can be seen in the next figure, the differences in prices of various maturities are greatest in the contracts with the shortest maturities and the curve flattens somewhat further out.

<sup>24</sup> UBS Investment Research: Physical storage and commodity returns. UBS cites the extreme case where US natural gas lost -93% from 1994-2008 due to consistently negative roll losses.

<sup>25</sup> Since 1991 for the S&P GSCI and DJ-UBSCI

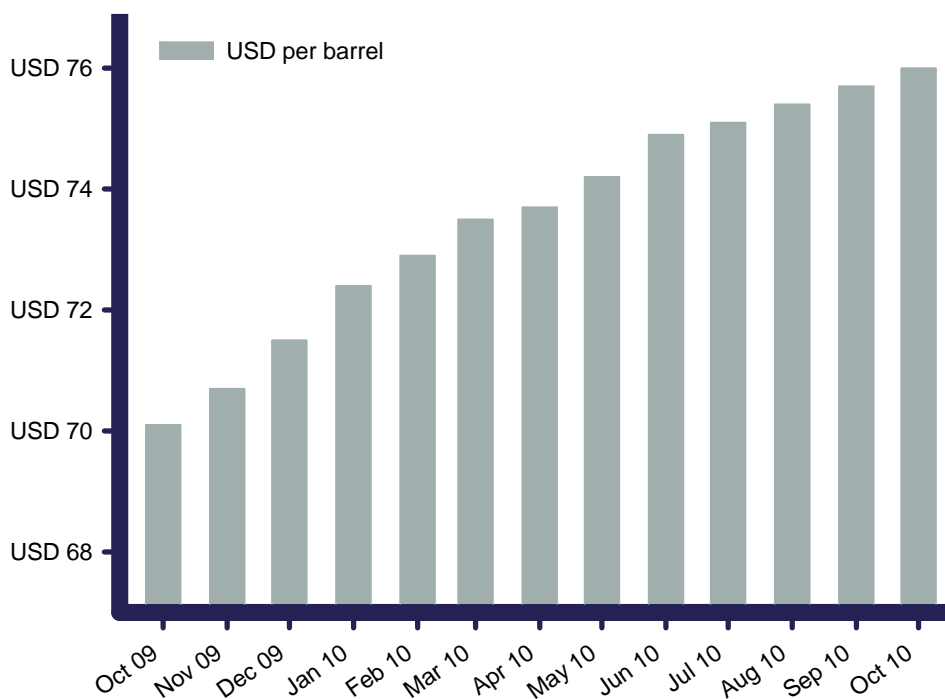
<sup>26</sup> Slope between first and second contract

<sup>27</sup> Spot price change plus roll return

<sup>28</sup> S&P GSCI Crude Oil Index

<sup>29</sup> S&P GSCI

Figure 12: Roll losses are often higher at the front end of the curve



Source: Bloomberg. Crude oil represented by WTI. Data as at 31 August 2009.

### Do commodities really provide an inflation hedge?

Commodities are real assets, unlike stock and bonds, which are financial assets. As inflation increases, real assets such as real estate, farmland or commodities tend to rise in price as well.<sup>30</sup> By contrast, equities tend to perform better during falling and/or low inflation environments as was the case in the 1990s and mid-2000s. To assess whether commodities indeed provide an inflation hedge, we analysed four time periods, during which inflation was above 5%.<sup>31</sup> These periods are shown in figure 13. Notably, commodity returns have been positive during all periods. During the mid 1970s and early 1980s, commodities performed particularly well. These numbers are total return based and investors should keep in mind that high inflation usually means high interest rates, which form part of total returns. As a consequence, some of the commodity's inflation-hedging properties derive from its collateral component, not from the price performance of the actual commodities.<sup>32</sup> Another important factor is sector dispersion. As seen in figure 13, not all sectors performed well during the time periods analysed. Industrial metals, for example, showed a negative performance twice and even the ultimate inflation beneficiary, precious metals, lagged in 1990. Furthermore, most commodity indices contain a sector bias. The S&P GSCI, for example, is heavily biased towards energy while the RJ CRB is rather agriculture biased.<sup>33</sup>

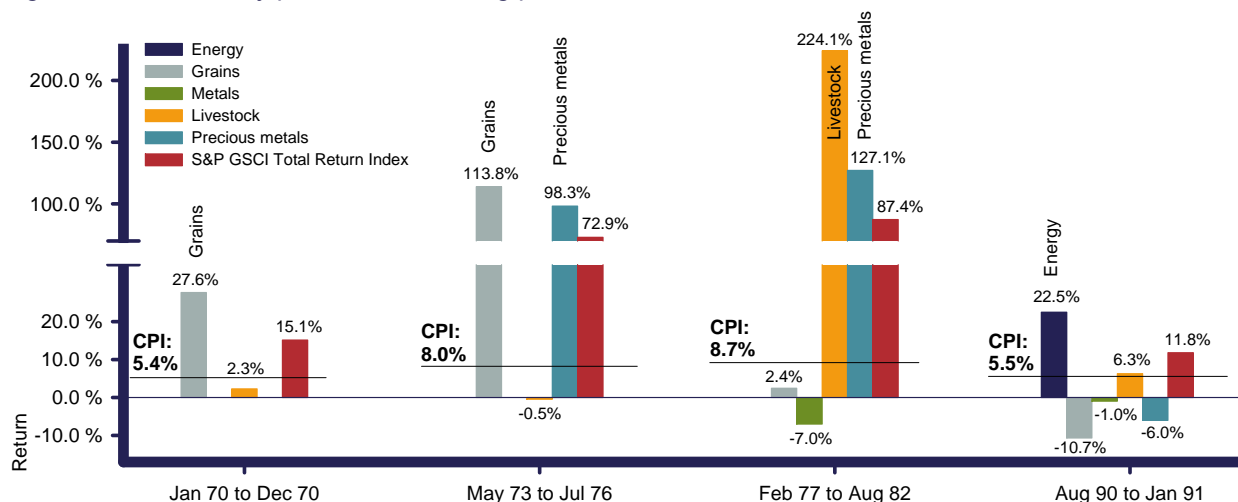
<sup>30</sup> Commodities could even be the root of the cause

<sup>31</sup> US CPI all items (year-on-year)

<sup>32</sup> Commodity price (spot) returns have also been positive, except for the time period from August 90 to January 19 91.

<sup>33</sup> See figure 2 for sector allocation of major commodity indices

Figure 13: Commodity performance during periods of inflation above 5%



Source: Man Investments Quantitative Research and Bloomberg. All indices are total return (TR) based. S&P GSCI indices are as follows: Energy: S&P GSCI Energy Official Close Index TR. Grain: S&P GSCI Grains Official Close Index TR. Metals: S&P GSCI Industrial Metals Official Close Index. Livestock: S&P GSCI Livestock Official Close Index TR. Precious metals: S&P GSCI Precious Metals Official Close Index TR. S&P GSCI TR Index: S&P GSCI Total Return Index. CPI: Consumer Price Index USA (International Monetary Fund). There is no guarantee of trading performance and past performance is no indication of current or future performance/results.

We believe that commodities have the characteristics (as real assets) to benefit from rising inflation and are likely to outperform other asset classes, particularly fixed income, in inflationary environments. However, investors should be cautious and should not blindly anticipate this outcome. One has to keep in mind the mean-reverting attributes of commodity returns. Figure 5 (historical performance of commodities) illustrated this clearly. Our analysis has also shown that commodities tend to perform well during significant increases in inflation (i.e. 1972-74 or 1977-1980) but then mean revert, even if inflation remains above average. Hence, we think it is likely that commodities would initially perform well should inflation rise above tolerable levels in the near future. At a certain point, however, the downside risks will increase, regardless of prevailing inflation levels.

With respect to deflation, one would expect commodities to underperform along with other risky assets as shown in figure 7 (lower left quadrant). While we think this basic concept is valid, investors should keep in mind that deflation would most certainly entail severe quantitative easing (money printing) which in turn could weaken confidence in the authorities and the USD. A weak USD would be beneficial for commodities. Hence, it is possible for commodities to perform reasonably well even in a deflationary environment.<sup>34</sup>

### Have the huge inflows into commodity ETFs over the last few years pushed up prices to unsustainable levels?

This is a perplexing question. There is no doubt that a lot of money has flowed into commodities over that last few years. As seen on figure 1, AUM linked to commodities has risen rapidly and is currently estimated to be in the region of USD 210 billion. Most of this money is institutional and linked to commodity ETFs that are based on the S&P GSCI or DJ UBS CI. There is probably no definitive answer as to the effect of investment activity on the commodity futures market. We believe that commodity prices have been driven higher by a number of factors, including increased demand from China, India and other emerging countries that need steel, oil and other raw materials to support manufacturing and infrastructure development. This increased demand has been difficult to satisfy as the commodity supply chain has suffered from a lack of investment until a few years ago. One also needs to consider that capacity expansions and new mines take years from planning to production. In our opinion, these factors have been the key drivers of commodity prices. However, we think that investment activity has also played a role. In fact, there is some evidence that money inflows into commodities have influenced the term structure and led to more contangoed markets as strong demand for second-month contracts pushes up prices.<sup>35</sup> As a consequence, it is possible that no market will remain consistently backwardated, which would reduce roll returns to the investor. Moreover, these money

<sup>34</sup> There is no historical data available to analyse commodities during a deflationary environment.

<sup>35</sup> According to Vanguard research, there has been some evidence that investment demand has led to more contangoed markets since 2004, particularly in energy.

flows are very transparent and essentially represent a crowded trade. Hedge funds have been benefitting from this by actively trading around these money flows.<sup>36</sup>

### Why should I invest in commodity hedge funds instead of long only?

Commodities are an attractive asset class in terms of historical returns and diversification benefits. In addition, commodities also have three independent return streams: spot prices, roll yields and interest income. Moreover, commodities are likely to perform well in an inflationary environment as they are real assets. Hence, investors should allocate to commodities. However, as we have outlined in this report, there are several pitfalls. By far the most important drawbacks are roll losses due to contangoed markets. As a result, investment returns have severely underperformed spot commodity prices over the last five years, as shown in the next figure. The most popular commodity index, the S&P GSCI with an estimated USD 55 billion tied to it, accumulated roll losses in each of the last five years. While roll losses have narrowed in 2007 and 2008, they have recently increased again. The main reason has been the steep contango in crude oil and natural gas during H1 2009.

Figure 14: S&P GSCI returns broken down into various components

	2005	2006	2007	2008	YTD 2009 <sup>37</sup>
S&P GSCI (spot return)	39.06%	0.45%	40.71%	-42.80%	32.58%
S&P GSCI (excess return)	21.61%	-19.07%	26.81%	-47.29%	4.53%
<b>S&amp;P GSCI roll return</b>	<b>-17.45%</b>	<b>-19.52%</b>	<b>-13.90%</b>	<b>-4.49%</b>	<b>-28.05%</b>
Interest income	3.95%	3.98%	5.87%	0.80%	0.15%
S&P GSCI (total return)	25.55%	-15.09%	32.67%	-46.49%	4.68%

Source: Bloomberg.

Investors should keep in mind that spot returns can not be achieved by them as futures that near expiry have to be rolled into longer maturities. Passive, long-only commodity funds usually replicate the total return index, which includes roll returns and interest income. Since 2005, when interest in investing in commodities surged, a long-only investor tracking the S&P GSCI (total return) would have lost 20.78% despite spot commodities being up 49.06%.<sup>38</sup> This result is obviously very disappointing. So, what are the alternatives? While some newer commodity indices are now available that aim to mitigate the roll return issues<sup>39</sup>, we believe that commodity hedge funds offer an interesting alternative.

It is difficult to estimate the number of commodity hedge funds currently available and the assets under management controlled by them. Many hedge funds trade commodities as part of a multi-strategy approach within the hedge fund styles global macro, equity hedge, relative value or CTAs. We estimate the number of hedge funds that allocate a significant portion of their asset to commodities to be between 200 and 300.<sup>40</sup> While there are managers that only trade commodity futures, others also trade commodity-related equities. The investment spectrum is large. Besides the traditional sub-sectors such as energy, base metals, precious metals, agriculture and livestock, a number of managers are also branching out to more diverse segments, such as emissions<sup>41</sup>, power, freight or transportation. Most managers use a discretionary approach based on fundamental research to identify over- or undervalued commodities and actively manage their portfolios. Some take a directional view on spot or near-term prices while others express a more nuanced view on the forward curve. It is also

<sup>36</sup> Since these index-linked money flows are very large and transparent, it is virtually impossible for them to go unnoticed

<sup>37</sup> 1 January to 30 September 2009

<sup>38</sup> Using the figures from figure 14

<sup>39</sup> These newer indices aim to optimise maturity structures and reduce the impact of negative roll yields. While this has the potential to add value, it is important to note that commodity futures at longer maturities have often limited liquidity. Moreover, there are limited historical data available on the performance of the long end futures which could make any conclusions prone to statistical biases.

<sup>40</sup> Man Investments Commodity Research

<sup>41</sup> Emissions include carbon and greenhouse gas trading such as CO<sup>2</sup>

possible to set up pair trades in related commodities (convergence or divergence) or express views on refinery margins, weather-related events, seasonal patterns, pending regulations, implied volatilities and of course basic supply/demand dynamics. There is a wide spectrum of instruments available to implement these views. Besides futures and stocks, managers can use derivatives such as swaps and options. In terms of diversification, certain managers only focus on one commodity sector, e.g. agriculture, while others follow a multi-strategy approach with a broad universe.

The exposure of commodity hedge funds is almost never 100% long, although many tend to be net long in aggregate. However, as we will see later in our natural gas example, a manager can also adopt a bearish stance and profit significantly from a downward trend. We believe that commodity hedge funds are able to provide relative stability in periods when commodity indices decline sharply. The ultimate test for this notion was the second half of 2008 when commodities collapsed and commodity hedge funds provided good downside protection. In fact, our quantitative analysis has shown that commodity hedge funds offer superior performance, lower volatility and better control of downside risks.<sup>42</sup>

### Will new anti-speculation law make commodity trading more difficult?

The rapid rise of commodities in general, and oil in particular, during H1 2008, when crude reached almost USD 150 a barrel, prompted many observers and politicians to speak of a bubble fuelled by speculators. Whether speculation has really been responsible, and to what extent, remains a controversial issue, with market participants, academics and even regulators holding differing views.<sup>43</sup> Over the course of the summer 2009, the Commodity Futures Trading Commission (CFTC) in the US held a series of hearings examining means of restricting future price spikes in commodities, with a particular focus on crude oil and other energy commodities. Specifically, the CFTC considered whether it would be appropriate to limit the number of futures contracts that an individual trader could hold, and whether there should be any change to the current exemptions available to certain market participants (e.g. swap dealers). The hearings included participants drawn from commodity exchanges, fund managers and banks as well as commercial participants in the futures markets. A range of opinions were heard, both on the role of speculators in the futures markets and possible measures that could be taken to limit 'excessive speculation' – and on the wisdom and effectiveness of such measures. It is too early at this stage to predict the outcome of these hearings in detail. However, it remains likely that some form of increased regulation will come into effect, possibly in the next few months. Such restrictions could entail hard position limits.

Most commodity hedge fund managers that we have spoken to are sceptical about the need for tighter position limits. They argue that most physically delivered contracts already function with position limits in place, being determined by the CFTC (i.e. agricultural) or the individual exchange (i.e. other commodities). These limits are usually more restrictive in the spot month, i.e., the month when the contract matures, as proximity to the physical delivery date increases the possibility of price volatility. Generally, these managers do not feel that smaller position limits will affect them in a material way, particularly given the depth and liquidity of these markets. Most of these funds operate with assets between USD 200 million to USD 3.5 billion with the smallest generally focusing on niches and the largest investing in diversified strategies. Currently, most managers are operating with no difficulty under existing limits and generally have ample leeway to expand positions. Given their size, they consider it unlikely that they would breach any imposed limits, even if these constraints are tightened. Additionally, many funds trade spread positions and are dispersed across the futures curve. Comparing this type of portfolio to a long-only, front month strategy, such as with ETFs, it seems likely that passive buy and hold strategies run a much greater risk of being affected.<sup>44</sup>

Furthermore, when debating this issue, it is important to keep in mind the global nature of commodities trading. There are great practical difficulties in attempting to control a global market from the US, as capital is very mobile and other jurisdictions would certainly welcome the increased business if the US would adopt stricter limits. With respect to oil, which is undoubtedly the most important commodity, the global perspective is particularly salient. Only a small fraction of the world output is actually traded on major exchanges. Currently, the open

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<sup>42</sup> Man Investments quantitative research. There is no publicly available index to show this.

<sup>43</sup> Regulators may seek to address these issues through increased transparency and oversight of these markets, and some have considered whether further measures are required, such as increased capital requirements

<sup>44</sup> As we discussed on page 3, passive, commodity-linked ETFs are managing about USD 210 billion

interest in oil futures at NYMEX is less than 3% of the world consumption.<sup>45</sup> Consequently, tougher regulations could drive business away from the US to other markets. However, whilst it is not apparent that other regulators are looking to impose hard position limits, the recent G20 Summit endorsed an approach of increased transparency and monitoring of commodities markets, seeking to address excessive price volatility. This is likely to lead to some form of enhanced regulation of these markets, even if that is achieved through openness and surveillance, rather than by hard limits.

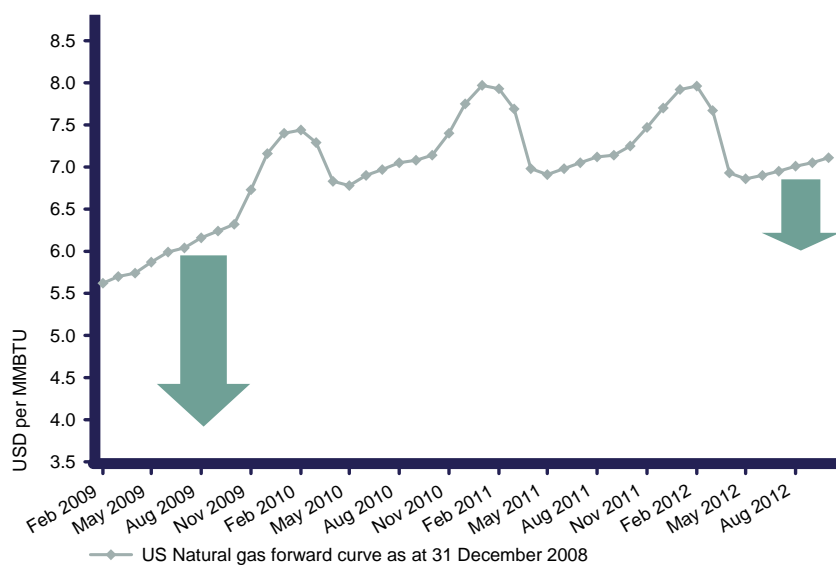
## How do commodity hedge funds make money?

As we described earlier, most commodity hedge funds use a discretionary approach based on fundamental research to identify profit opportunities. These can be outright longs or shorts or various combinations along the forward curve. Two recent examples follow:

### Trade example 1: Natural gas bear spread curve steepening

At the beginning of 2009, the manager had a bearish view on the outlook for US natural gas. With a slumping economy, the expectation was that industrial demand would be weak throughout 2009. In the absence of a very hot summer or supply disruption caused by hurricanes the manager expected the short-term prices to drop considerably, anticipating a glut of natural gas over the summer, and perhaps beyond, because of robust supply and increasing use of LNG.<sup>46</sup> The next chart shows the forward curve for US natural gas at the end of 2008.

Figure 15: US natural gas forward curve



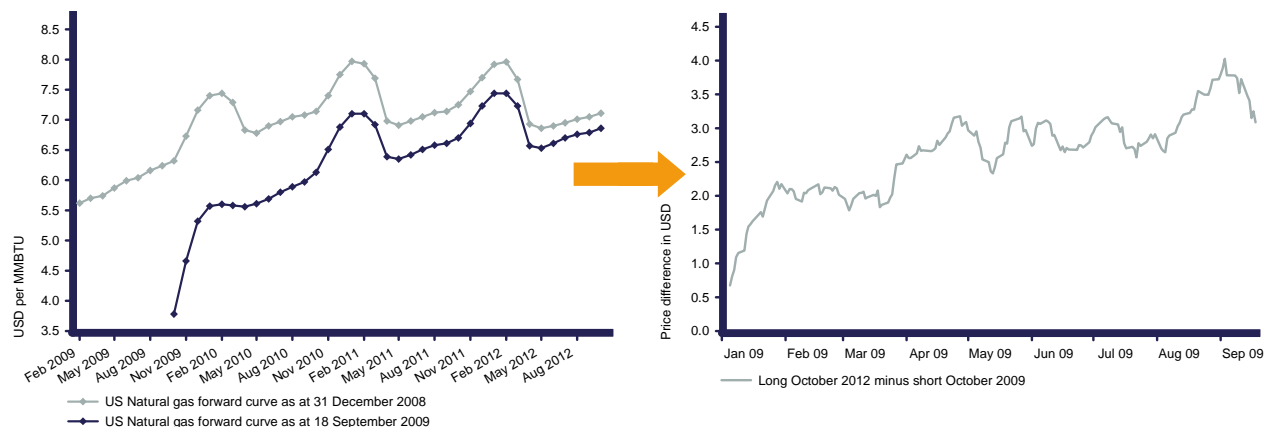
Source: Bloomberg. Data: as at 31 December 2008.

The manager entered a bear steepening trade, i.e. he expected the forward curve to steepen significantly due to a fall in summer and autumn 2009 contracts relative to contracts several years further out. In particular, shorts were placed for September, October and November 2009 maturity and longs at calendar year 2012. As the next chart shows, the forward curve indeed steepened significantly due to a glut of natural gas over the summer of 2009.

<sup>45</sup> TIME magazine: Why there should be more oil speculation, not less 10 July 2009.

<sup>46</sup> Liquefied natural gas

Figure 16: US natural gas forward curves and profit and loss from bear steepening trade



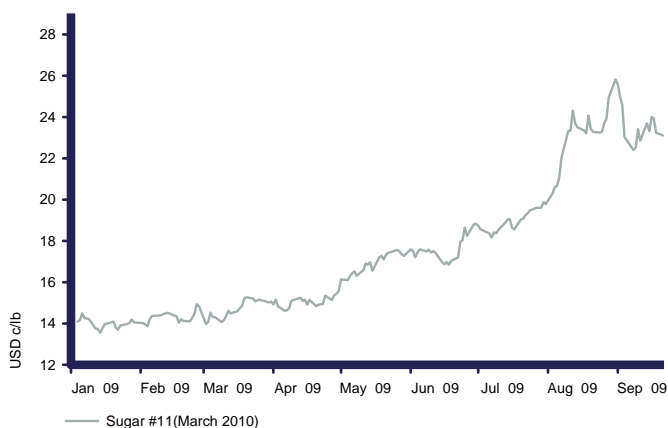
Source: Bloomberg.

As illustrated in figure 16, this trade turned out to be very profitable. The near-end of the curve dropped considerably more than maturities further out. The curve shift was caused by depressed demand due to the bad economy in combination with robust production, lack of adverse weather conditions and limited storage. However, these factors are temporary in nature and less important further out the curve.

### Trade example 2: Directional long sugar

During the early spring of 2009 the manager observed a bullish shift in fundamentals for sugar. Poor industrial yields in India, a large producer and consumer, led to a tightening of global supply for sugar. On top of this, poor monsoon rains in the key sugarcane growing areas of India further supported the view that sugar prices would rise on the back of a reduced supply and relatively stable demand. With the expectation of rising prices, the manager bought March 2010 raw sugar futures. With this maturity, the manager chose a relatively near-term contract in order to benefit from a rising convenience yield.<sup>47</sup> After the market realised the full extent of the Indian shortage, the price began to rise strongly in July and August 2009 and reached a 28-year-high on 1 September 2009. Brazil as the largest producer and exporter could partially, but not fully offset the Indian shortfall as Brazil itself was also affected by bad weather as well as restricted financing.<sup>48</sup>

Figure 17: The price of sugar during 2009



Source: Bloomberg. Time period analysed: 1 January 2009 to 21 September 2009

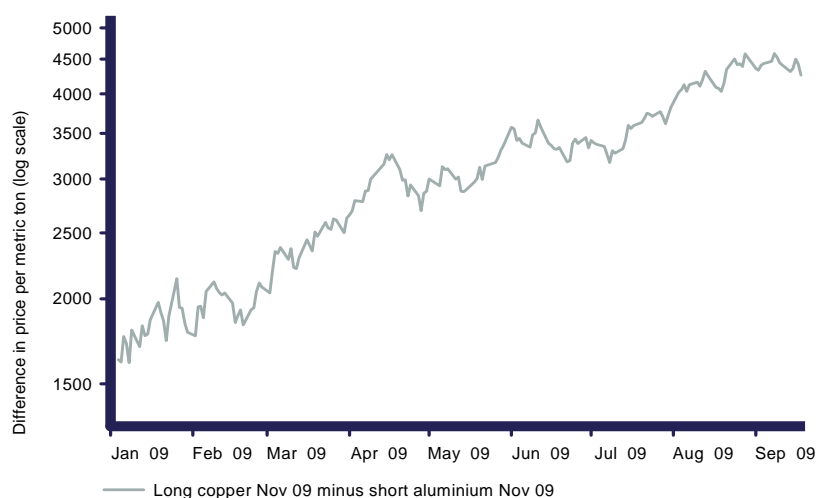
<sup>47</sup> If inventories are low and there is a risk of a supply disruption, the convenience yield (benefit from instant or very near-term delivery) rises. Hence, nearby futures rise more than longer term futures as the situation is set to normalise when more sugar cane is grown and inventories are re-stocked.

<sup>48</sup> In addition to too much rainfall, Brazilian sugar mills have also had restricted financial resources due to the credit crunch.

### Trade example 3: Base metal relative value trade

Base metals are generally very susceptible to economic cycles. Hence, it was no surprise that base metals declined heavily during H2 2008 when the global economy collapsed. As a result, various stimulus packages around the world were announced. In early 2009, the manager observed increased buying from China for copper and zinc. With the expectation of continued Chinese demand for infrastructure related base metals, the manager entered a long position in copper.<sup>49</sup> At the same time, the expectation was that base metals related to consumer themes would continue to be weak as they would not benefit nearly as much from the stimulus packages announced by the central banks. Aluminium was a good proxy for a 'consumer-metal' as it is primarily used in aerospace and car production.<sup>50</sup> Consequently, the trade was long copper and short aluminium as a proxy for long infrastructure themes versus short consumer themes.

Figure 18: Copper outperformed aluminium



Source: Bloomberg. Time period analysed: 1 January 2009 to 21 September 2009

### Is there a way to invest in physical commodities?

There has been growing interest from the asset management community in physical commodities. This entails buying and storing underlying assets rather than trading futures contracts. The main advantages are: no roll losses, ability to fully benefit from convenience yield, no position limits and the benefit of owning a real asset. The main disadvantages are: storage costs, insurance premiums, potential exposure to negative press (e.g. hoarding during a supply crunch) and spoilage (such as fungal decay of soft commodities). By far the easiest commodity to physically hold is gold. As seen in figure 9, it is very cheap to store and there is no decay. Other precious metals have similar characteristics. As a consequence, there are already a number of ETFs tracking precious metals available which physically store their assets. For other commodities, however, this is more difficult. Some base metals would probably be feasible. In fact, some preparations are made for this.<sup>51</sup> We feel that apart from precious metals, physical investments will remain a niche because of the impracticalities of high costs and operational issues.

<sup>49</sup> While copper also has some consumer exposure, the primary use is industrial and infrastructure-related

<sup>50</sup> In addition, China is not an importer of aluminium

<sup>51</sup> ScotiaMocatta, a Canadian bank, is seeking regulatory approval for a fund that will invest in physical copper while Credit Suisse is working with Glencore on an aluminium ETF.

## Summary and conclusion

Commodities are a distinct asset class with returns that are largely independent of traditional investments, such as stocks and bonds. Hence, commodities are excellent diversifiers. Historically, commodity performance has been very inconsistent, with various booms and busts over the last 40 years. Most academic research has shown that commodities provide a fairly good hedge against inflation. However, not all commodity sectors have performed equally well during past periods of elevated inflation. Indeed, our research has shown that commodities performed well during sharp increases of inflation, but then often mean reverted even if inflation remained above 5%.

Long-only commodity investors can expect to achieve total returns, which are comprised of spot prices + roll returns + interest rates. It is important to note that roll returns and interest rates have historically explained a large part of total returns. Interest rates have made a significant impact during high interest rate periods in the 1970s and 1980s and over long time periods due to the compounding effect. Currently interest rates are low and negligible. Roll returns occur when current futures contracts are rolled into longer maturities to avoid delivery. Depending on the term structure (contango or backwardation) this can result in a gain or a loss. Over the last five years roll returns have been heavily negative which has resulted in severe underperformance for long-only investors. Over longer time periods, our research has shown that roll returns have exerted a drag of 3-4% on commodity index returns since 1990. Going forward, we expect roll returns to continue to be a problem as there is some indication that contangoed markets may persist.

With this in mind, we think that commodity hedge funds offer an interesting opportunity to access the commodity assets class. Commodity hedge funds usually use a discretionary approach based on fundamental research to enter long and short positions either outright or as a relative value trade. The majority of such funds are active in the futures markets, but some also participate in the equity market. With respect to new anti-speculation laws, e.g. more restrictive position limits, we think that commodity hedge funds are likely to be less affected than long-only funds due to their smaller size and larger diversification across the entire futures curve. Overall, we conclude that commodity hedge funds provide a better alternative compared to long-only strategies.

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